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Liquid Measuring Apparatus.

The canning of oils for exportation, especially coal oil and spirits of turpentine, has grown within a few years into a business of great magnitude. The difficulty of procuring a vessel not liable to leakage or breakage has been overcome by the invention of the can shown in Fig. 5, which is known as "Pratt's Improved Patent Can." This can is of rectangular form, with corrugated sides and ends, which method of construction, with the peculiar process of manufacture, gives great strength with the least material, and provides for the most compact and convenient storage. This can is the subject of three patents in its form, and of others in the process of construction.

It was found, in preparing oils for shipment, that much care was required to get the exact amount in each, and also to adapt the measure to the different standards of liquid measure in use in this and other countries. These requirements and difficulties led to the contrivance of the apparatus seen in the accompanying engravings.

Fig. 1 is an external view of the measure, with its appendages, and Fig. 2 is a vertical section. Figs. 3 and 4 show the faucet and cock. A is the measure, made of sheet metal, and of any form desired. The measure is air-tight. On the top there is a metallic collar, B, on which is a ring or annular nut, C, designed to form a stuffing box for the cylinder, D, which may be solid or hollow, but should not be open. It is raised or lowered into the vessel, A, by means of a screw, E, which turns in a thread cut in the upper part of the cylinder, D, and passes through a yoke, F. By lowering or raising the cylinder, it is evident the capacity of the measure may be adjusted. By thus varying the capacity of the measure the measurements of different countries may be compensated for, and also the difference in bulk occasioned by changes of temperature.

Means for the escape of the air during the process of filling are afforded by the chamber, G, and valve, H. The chamber connects with the interior of the vessel, A, by an opening under the valve, H. This valve is rather smaller in diameter than the interior of the chamber, sufficiently so to allow of the escape of the air around its sides, and through the opening at the top of the chamber, as the vessel fills with liquid, and forces it out.

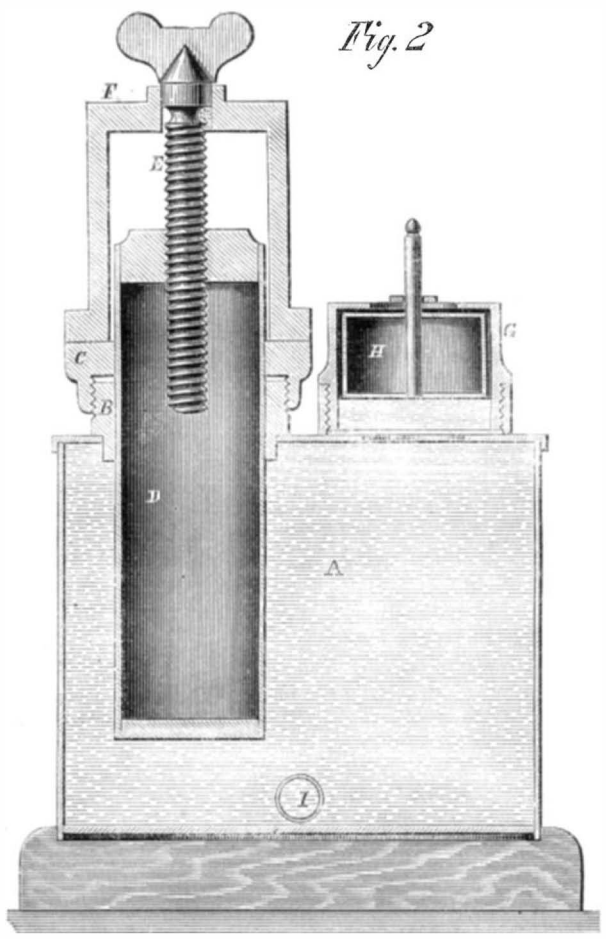
The oil or other liquid with which the measure is filled enters it at the bottom through the pipe, I, from the tank or reservoir. This pipe is of bent form—an obtuse angle—as seen plainly in Fig. 4, and having a two-way cock, J, at the angle; in Fig. 4 the passages in the cock are seen as open to each branch of the pipe. A chamber, K, projects from the angle of the pipe, I, and its wide end is closed by a plate, L, having two holes, as seen clearly in Figs. 3 and 4. M is a plate attached at its lower part by a pivot to the plate, L, moved by the handle, N, and guided by a pin working in a curved slot. To the plate, M, are firmly secured two curved nozzles, seen in Figs. 1 3 and 4. The bent pipe is not seen in Fig. 1.

The operation is as follows: Suppose the measure, A, to be empty, and the operation of canning to be commenced. The two-way cock, J, is turned in the position seen in Fig. 4, so as to permit the flow of oil from the tank or reservoir into the measure, A, and, as it fills, the air escapes up through the chamber, G. the valve, H, being down. When the measure is filled it is indicated by the valve stem, the valve being raised so as to close the aperture in the top of the chamber, G. The measure being filled, the plate, M,—Figs. 3 and 4—is turned so as to bring one of the nozzles into the aperture of the can to be filled. The position of the nozzles, when thus in use, is shown in Fig. 3, the dark aperture in the plate, L, being in connection with the depressed nozzle. The two-way cock being turned, communication between the tank and measure is closed, and that between the measure and can to be filled is open. When the measure, A, is empty, the plate, M, is turned so as to raise the depressed nozzle, and depress the other into another can, and the process of measuring is repeated while the filled can is being soldered. (The can is seen in Fig. 5. It is of tin, the sides corrugated, which gives great strength with lightness.)

With this apparatus there is no waste by drip or leakage, all differences in measure standards and variations of temperature are adjusted, and the filling from the bottom insures accuracy impossible to be obtained when measures are filled from the top. It was patented through the Scientific American Patent Agency, Sept. 17, 1867. All further information relative thereto may be obtained of the owner of the patents, Charles Pratt, manufacturer and dealer in oils, 108 Fulton street, New York.

Fig. 1

Fig. 2



APPARATUS FOR MEASURING LIQUIDS WITH PRECISION.

Fig. 3

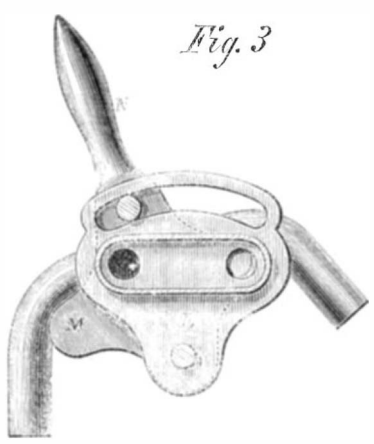


Fig. 4

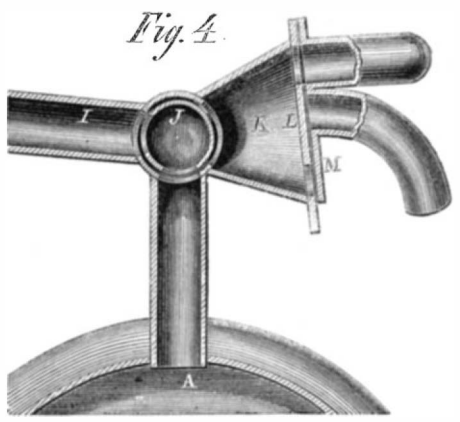
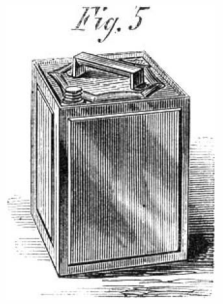


Fig. 5



ANILINE---ITS HISTORY, PROPERTIES, AND PREPARATION.

Aniline was discovered in 1826 by Unverdorben. The original method for its preparation was by digesting indigo with hydrate of potash, and subjecting the resulting product to distillation. Aniline was also obtained from the basic oils of coal tar; but the process which is now employed for its preparation is a remarkable instance of the manner in which abstract scientific research becomes, in the course of time, of the most important practical service. It was Faraday who first discovered benzole; he found it in oil gas. After this it was obtained by distilling benzoic acid with baryta, which result determined its formula, and was the cause of its being called benzole. After this, Mansfield found it to exist in large quantities in common coal-tar naphtha, which is the source from which it is now obtained in very large quantities. Benzole, when studied in the laboratory, was found to yield, under the influence of nitric acid, nitro-benzole. Zinin afterwards discovered the remarkable reaction which sulphide of ammorium exerts upon nitro-benzole, converting it into aniline. And, lastly, Bechamp found that nitro-benzole was converted into aniline when submitted to the action offerrous acetate. It is Bechamp's process which is now employed for the preparation of aniline by the tun. Had it not been for the investigations briefly cited above, the beautiful aniline colors now so extensively employed, would still remain unknown. When Mr. Perkins discovered aniline purple, nitro-benzole and aniline were only to be met with in the laboratory; in fact, half a pound of aniline was then esteemed quite a treasure, and it was not until a great deal of time and money had been expended that he succeeded in obtaining this substance in large quantities. and at a price sufficiently low for commercial purposes.

The coloring matters obtained from aniline are numerous; they are the following: Aniline purple, violine, rese ine, futschine, alpha aniline purple, bleu de Paris, nitrosophenyline dinitraniline, and nitro-phenyline diamine.

Pure aniline is a colorless liquid, very astringent, having an aromatic odor and an acid burning taste, slightly soluble in water, very soluble in alcohol and ether. Its specific gravity is 1·028, It does not freeze at —20. It boils at 262·4° Fah., and distils unchanged. When warmed it dissolves sulphur and phosphorus. It is a powerful basis, combining with acids, and forming salts, which in general are soluble. It decomposes salts of protoxide and peroxide of iron, and the salts of zinc and alumina, precipitating from them the metallic oxides. It precipitates also the chlorides of mercury, platinum, gold, and palladium, but does not precipitate the nitrates of mercury and silver. Aniline easily oxidizes, turning yellow in water, and in time becoming resinified.

When aniline dissolved in hydrochloric acid is acted on by chlorine, the solution takes a violet color, and on continuing the current of chlorine, the liquid becomes turbid and deposits a brown-colored resinoid mass. In distilling the whole, vapors of trichloraniline and trichlorophenic acid pass over.

A solution of the alkaline hypochlorites colors aniline violet blue, which turns rapidly red, especially in contact with acids. A mxture of hydrochloric acid and chlorate of potash acts on aniline, the final result of the action being chloranile C^{12} Cl^4 O^4, but in the course of the reaction several colored intermediary bodies are formed.

If a solution of chlorate of potash in hydrochloric acid be added to a solution of a salt of aniline mixed with an equal volume of alcohol, and care is taken to avoid an excess of the hydrochloric solution, a flocculent precipitate is deposited after a time of a beautiful indigo blue color; this precipitate filtered and washed with alcohol contracts strongly, and passes to a deep green. The filtered liquid has a brownish red color; on boiling it, adding fresh quantities of hydrochloric acid and chlorate of potash, a yellow liquor is obtained, which deposits crystallized scales of chloranile.

An aqueous solution of chromic acid gives, with solutions of aniline, a green, blue, or black precipitate, according to

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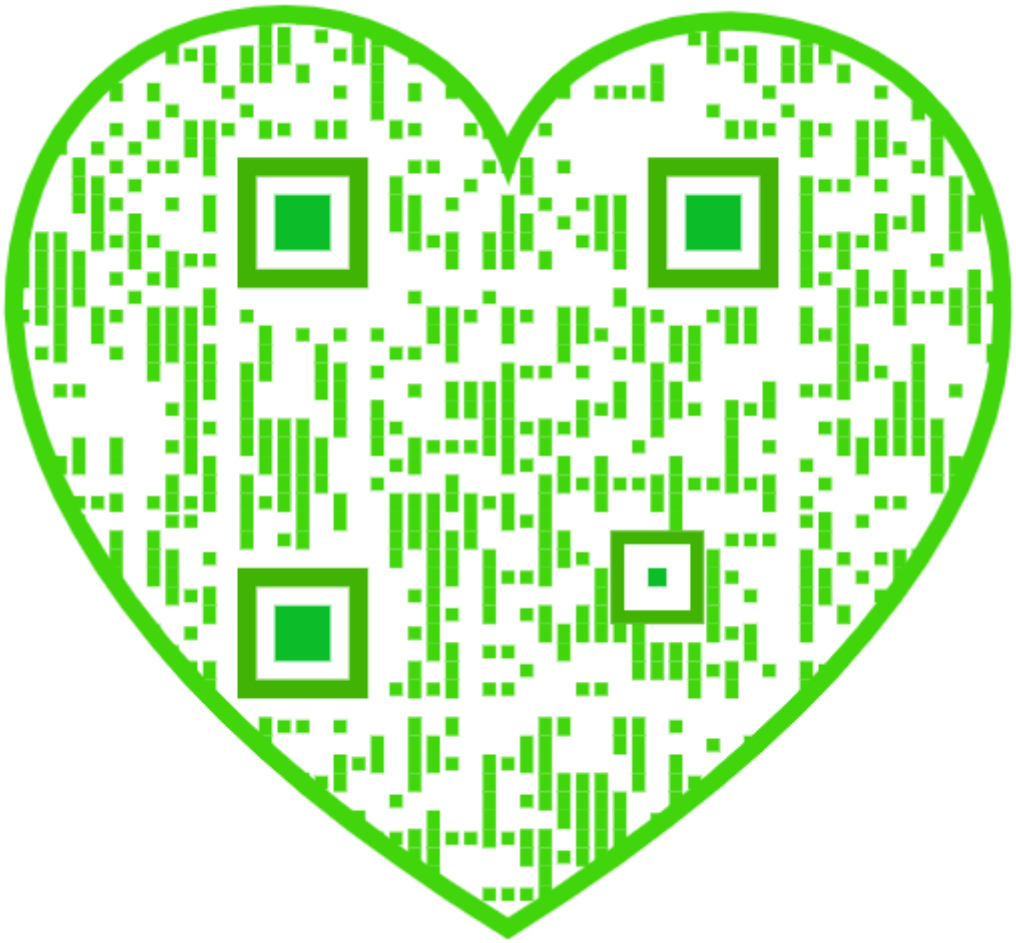

the concentration of the liquors. When a small quantity of an aniline salt is mixed in a porcelain dish with a few drops of strong sulphuric acid, and a drop of a solution of bichromate of potash is allowed to fall on the mixture, a beautiful blue color appears after some minutes, which, however, soon disappears.

Diluted nitric acid combines with aniline without adhering to it immediately; but after some time nitrate of aniline crystallizes in the form of concentric needles, the mother liquor turns red colored, and the sides of the evaporating dish become covered with a beautiful blue effervescence. When a few drops of strong nitric acid are poured upon aniline, it is immediately colored a deep blue; on applying heat the blue tint quickly passes to yellow, a lively reaction is manifested, which results in the formation of picric acid, or trinitrophenisic acid.

Potassium dissolves in aniline, disengaging hydrogen, while all becomes a velvet-colored pap.

The method which appears to be the most rational, and which deserves to be tried, would consist in treating the tar as condensed in gas works with hydrochloric or sulphuric acid diluted with three or four times its volume of water. Mechanical means for affecting the intimate mixture of the tar with the acid might be easily contrived, but in the absence of any special contrivance, the end may be obtained by half filling a barrel with the tar, adding one-fifth or one-sixth of its volume of acid, and rolling and shaking the barrel until the acid has taken up the bodies with which it is able to combine; the whole might thus be run into a cistern, where by degrees, the watery liquid would separate from the tar.

The same acid liquid might be used over and over again until the bases have nearly saturated the acid. A very impure aqueous solution would thus be obtained, containing the hydrochlorates or sulphates of ammonia, and all the other organic bases contained in the tar, such as aniline, quinoline, pyrrol, picoline, pyrrhidine, lutidine, toluidine, cumidine, etc.

By evaporating this solution almost to dryness, and then distilling with an excess of milk of lime, the bases would be set at liberty. Ammonia as the most volatile, would be disengaged first, and might be condensed apart, and by raising the temperature higher and higher, the organic bases would be disengaged. Aniline would be found among the liquids distilling between 302° and 482° F.

The manipulation of the tar, however, is a disagreeable operation, and presents many difficulties; it is therefore preferable, in many cases to distil the tar first, and operate on the most pure and limped distilled oil.

Aniline, because of its high boiling point, is never met with, in the light and volatile liquids when first distilled from tar. The most of it is found in those which distil between 302 and 356°. These, according to Hoffman, contain about ten per cent of organic bases, mostly aniline and quinoline. The oils which distil above 482°, contain mostly quinoline and very little aniline.

The following process for extracting the two bases form the oil and separating them is due to Hoffman. The oil is agitated strongly with commercial hydrochloric acid. The mixture is then allowed to rest for twelve or fourteen hours and the oil is separated from the acid; the latter is treated again by fresh quantities of oil until nearly saturated. The still acid solution is filtered to retain the oil interposed mechanically. It is then placed in a copper still and supersaturated with an excess of milk of lime. At the moment of saturation an abundance of vapors are given off, and the head must be quickly fixed on the still. Heat is now applied so as to obtain a quick and regular ebullition.

The condensed product is a milky liquid with oily drops floating on it. The distillation is carried on as long as the vapor has the peculiar odor of the first part distilled, or the condensed product gives the characteristic reaction of aniline with chloride of lime.

The milky liquid is now saturated with hydrochloric acid; it is then concentrated in a water bath; and lastly, decomposed in a tall narrow vessel by means of a slight excess of hydrate of potash or soda. The bases set free, unite and form an oily liquid which floats on the alkaline solution. This is removed with a pipette and rectified. The rectified product is aniline, sufficiently pure for industrial purposes, especially if we set aside the part distilling about 392° or 428° Fah., which is principally composed of quinoline.

To obtain aniline perfectly pure, the neutral oils forming part of the oily layer must be completely removed. This is done by dissolviag the whole in ether, and adding dilute hydrochloric acid which combines with and separates the bases and leaves the oil in solution in either. The acid solution is then decanted, decomposed with potash, and submitted to careful fractional distillation. If the products are gathered separately in three parts, the first will contain ammonia, water and some aniline; the second will be pure aniline; while the third portion will contain mostly quinoline. An alcoholic solution of oxalic acid is now added to the impure aniline, which precipitates oxalate of aniline, as a mass of white crystals, which are washed with alcohol, and then pressed. The salt is then dissolved in a small quantity of water, to which a little alcohol is added. From this solution the oxalate crystallizes in stellated groups of oblique rhomboidal prisms, These crystals are decomposed by a caustic alkali, to set free the aniline, and when this is distilled, water at first passes, then water charged with aniline, and lastly, at 359° Fah., chemically pure aniline.—*Dussauce.*

THE CHINESE COAST.—Preparations are being made for the erection of a complete system of lights and beacons along the Chinese coast. Up to this time fifteen points have been chosen.

EARLY HISTORY OF AN INVENTOR.

Rev. Jedidiah Morse, of Charlestown, Mass., was the father of S. F. B. Morse, the inventor of the telegraph, and of Sidney E. Morse, of the New York *Observer*. From a memoir of his father, lately published by Sidney E., we derive the following interesting particulars of the family and of the distinguished inventor.

The first Sunday school ever organized in this country is stated to have been founded at Charlestown, Mass., in the church of which Rev. Jedidiah Morse was pastor. The first superintendent of that school was the inventor of the telegraph, S. F. B. Morse. His brother writes as follows:

"In 1811, my elder brother, Samuel F. B. Morse, having manifested an unconquerable desire to become an artist, my father sent him to London, placed him in the British Royal Academy, then under our countryman, Benjamin West, and maintained him there for more than four years, and until the close of 1815, when he returned to Charleston after having received at the hand of the Duke of Norfolk, the gold medal of the Adelphi Society for his model of a statue of 'The Dying Hercules,' his first attempt at sculpture; and from Mr. West high commendations for his paintings, exhibited at the Royal Academy under circumstances which did not allow his competition for the prizes.

"In 1816, my brother became the first superintendent of your Sabbath school, and was then proposing to establish himself in his profession in Boston; but, not meeting with the encouragement he expected, he removed first to New Haven, and afterwards to New York, where he became the founder of the National Academy of Design, an institution which, from its commencement in 1826, has had no superior of its kind in America in the promotion of the fine arts, and over which your first superintendent was called to preside, by the annual election of his brother artists, every year for sixteen years, and until he relinquished his profession to devote himself entirely to his electric telegraph, 'the lines of which,' since they were successfully laid between Washington and Baltimore in 1844, have literally 'gone out through all the earth, and its words to the end of the world.'

"Prior to the relinquishment of his profession as a painter, however, your first superintendent was the instrument in the hand of Providence, of introducing into this country that great (I may say the greatest) wonder of our age, the new Art of Photography. Photography, under the name of the Daguerreotype, it is well known was invented by the celebrated Daguerre, a French artist, who exhibited his first collection of specimens to the members of the French Academy of Sciences, in Paris, early in the year 1839. My brother was in Paris at the same time, exhibiting his telegraph to the same persons. Brother artists and brother inventors, thus brought together, each was invited to examine the other's invention; and my brother became earnest in his desire to introduce the Daguerreotype into America. On his return to New York, in April 1839, he inspired me and my younger brother with a portion of his own enthusiasm. He was then entirely destitute of pecuniary means; and after ascertaining what was wanted to enable him to gratify his and our wishes, we removed the central part of the roof of our six story building, covered it with a skylight, furnished the new chamber with cameras and the other apparatus of photogarphy, and, having thus completed the first "tabernacle for the sun" erected on the Western hemisphere, placed your first superintendent there to fix, for inspection through all time. the perfect image of men and things, as the great Painter, from his tabernacle in the heavens, flashed them upon the silvered plates. It was in that chamber that he, who first practiced the art of training in your Sabbath school, in 1816. trained the young men who went forth rejoicing, from New York into every part of our land, to work the wonders, and display the beauties of the new art, eliciting admiration from all beholders, and from the devout the exclamation, which four years afterward, passed in an instant through the wire from Washington to Baltimore, to be recorded there, while it was echoed everywhere, "What hath God wrought!"

It may not be known to all readers that the first message sent by the inventor of the recording telegraph, through his first telegraph line, on its completion from Washington to Baltimore, in 1844, was, "What hath God wrought!"

Galvanic Electricity upon the Muscular and Nervous System.

The effects of the galvanic current on the nerves and muscles of animals, is essentially the same as that produced by frictional electricity, modified, however, in some degree, by the continuous action of it. They are also characterized by the presence of some chemical influence, which excites the organs of taste and sight in a remarkable manner. Very small batteries are adequate to excite the organs of taste and sight, but a large apparatus is needed to produce any perceptible influence on the sense of touch, so as to cause the muscles of the human body to contract, when it forms part of the circuit. Galvani, in his fundamental experiment, touched the nerves of a dead frog's spine and the muscles of one of his thighs with two different metals, and then forming a circuit by a wire between them, the leg became violently contracted. When the nerves of vision are made to form part of the voltaic connection, peculiar luminous flashes will appear before the eyes. The excitement of the organ of hearing under similar circumstances is not less interesting, a roaring sound being heard as long as the wires are kept in place. On closely observing the effect of galvanic electricity upon the muscular and nervous system, three distinct stages in the process are readily seen. First, when the circuit is completed, an electric shock is experienced; next, the continued action of the current causes a series of contractions rapidly succeeding each other; and lastly, when the connection is broken, a less violent shock than before is felt. The shock of the voltaic battery differs from that of common electricity, as the latter is felt far less deeply, affecting only the outer part of our organs, and being exhausted in a moment. The voltaic shock, on the contrary, penetrates further into the system, passing along the entire course of the nerves. The influence of the galvanic current on the nervous system, has been successfully applied to the restoration of persons in whom animation was suspended. By means of it Aldini set in motion the feet of a corpse, caused the eyes to open and shut, and distorted the mouth, cheeks, and the whole countenance. Ure, by completing the circuit through the body of a man recently hung, caused the muscles of the face to acquire a frightful activity, so that rage, despair, and anguish, with horrid smilles, were successively depicted on the countenance. —*Telegraphic Journal.*

Two Curious Plants in California.

In the Southern coast is a species of the familiar mullen, and of a small species of teazle burr, both of which are peculiar to the Pacific coast. The burr is about as troublesome a member of the *dipsacus* family of plants as the cattle or sheep breeder is acquainted with. From July to October it is met with in the lower countries, covering the alkali or moist soils in hundreds of acres, and presenting a vigorous growth of verdant vegetation at a time of the year when nearly all other plants are bronzed with age or burnt to powder. The California article is a small species of teazle, with from sixty to one hundred burrs, the size and shape of a blackberry, but stuck full of spinous points, which, when mature, catch in the manes and tails of sheep, horses and cattle in great masses, and make the animals present as ludicrous an appearance as quadrupeds can be guilty of, and they are the abhorrence of dogs and cats. Whole bands of *caballaba* may be seen on the large ranchos, with their caudal appendages full of these burrs, and giving the herdsman an immense quantity of trouble in the extraction, and on many farms it is the daily occupation of the horseman to trim them from his favorits with his knife or his fingers. In many places they seriously injure the quality of the wool. This troublesome plant grows to the height of some three feet, and with its large, heart-shaped leaves presents a deceitfully inviting appearance to one who is a stranger to its annoyances; for when the burrs are ripe they fall off at the least touch, and are as molesting to the rider as to his animal. It is one of the worst of weeds in a garden, the fruit taking root wherever there is the least modicum of moisture. The only thing good about this disreputable vegetable is the fragrance of the leaves when bruised, which emit an agreeable perfume of mint and lemon.

The member of the California mullen family mentioned is very abundant, not only throughout the Southern coast, but covers hundreds of thousands of acres of land in the plains of the great valley of the Sierra Nevada to the west, where with the *wichapora*, in the fall, it crowds out nearly every herb of the fields. Growing to the height of three or four inches, and spreading out into immense, blanket-like masses, over leagues upon leagues of land, on hill and plain, with its silvered, downy leaves, it makes every appearance at a distance, in the afternoon sun, of extended pools of standing water, and really has deceived many thirsty travelers, strangers to its delusions and vagaries. The leaves are the perfect outline of a heart, and of the size of that of a rose, and when pressed emit a smell of melon faintly mixed with marjoram. Though thousands of sheep may be walking among its masses, I never noticed one of them to feed on it; but as nothing was made in vain, the ground doves love the seed of the plant as much as cows do clover, and on opening their crops in the fall months they are found to be full of the small black seeds of the mullen. It is entirely different from the Atlantic mullen, which carries leaves as large as that of the mustard, with a central stalk three and four feet in height, whereas the mullen member of the California *Verbascum* has a diminutive leaf, and bears no column like the other, but a small trunk like a pepper bush. It is called by the natives *Pollei*, in some places, and in other *Yerba de Cenisa*, from its downy leaves, which are of the color of fresh wood ashes, and in medicine makes an elegant demulcent infusion for fevers and catarrhs, or in mass with hot water as a soothing cataplasm. The immense masses of this curious plant, when stirred by breezy gales of a summer afternoon, will sheen and twinkle with the rays of the sun as if Sol was amusing himself after the heats of the day on a sea of molten silver or silken floss, before he hies to bed behind the mountain peaks to dip his vexed, hot, monstrous red face west of the California Cape Horn in the waves of the ocean—where we will leave him till the cooler dawn.—*Cor. Steamer Bulletin.*

SOLAR AND LUNAR HALOS.—M. A. Decharme, Professor at the Imperial Lyceum of Angers, observes with much care the great and small solar and lunar haloes and coronæ, and has ascertained, that—1st, At Angers these phenomena are more frequent than is generally believed, thirty-three being observed by him during last year. 2d, In all cases they were followed by rain or snow on the same day, the day following, or, at latest, on the third day. 3d, That in general the rain is the nearer and more abundant in proportion to the brilliancy of the phenomenon. His observations simply confirm the generally received belief of all the weatherwise.

THE NEW GRASS which has made its appearance in the Southern States since the war, is called *Lespidosa striata*, and is said to be a native of China and Japan. It appears to be a dwarf clover, very thick set, much relished by cattle, and is a complete exterminator of Bermuda, joint, sedge, and other grasses. It was not seen before the war, and how it was introduced is a mystery among planters and botanists.

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THE PERMEATION OF ORGANIC AND OTHER FLUIDS.

It is well know that at various stages of the functions of different organs there is a direct passage of liquor from one portion to another of the organs. Thus, for example, from the stomach and bowels at certain periods there is a permeation of liquor, consisting of the soft and dense fluid products of digestion, through the side of the intestinal canal, into the blood and lymph vessels, which ramify in the thickness of its walls. So too, also, there is during certain periods a transit of fluid from the blood vessels, ramifying through certain glands (for example, the salivary) into the ducts of the mouth. Phenomena of this character have been long mistakenly likened to those which were transacted between different fluids partitioned outside of the animal organisms. The whole two series together have been comprised as endosmosis and exosmosis.

If a glass vessel have a thin, upright partition of plaster of Paris through its center, and on the right hand side brine be placed, and on the left pure water be poured, until the divided fluids are at one level, a flow is immediately established through the partition, and the brine will soon rise, while the clear water will lower in exact proportion. This is endosmose. The mixture of the two fluids, if the partition were removed, would be easily understood as one of the simplest of mere physical phenomena, and the only action of the partition is to graduate the rate of the flow, and thus allow the phenomena to be observed.

This is strictly true with substances having such large pores as plaster; but when an inanimate membrane is used the tissue of it seems to exert a more definite action. The change in volume of the side by side fluids depends on the difference of their properties. In mixable liquids this is determined by their capacity for water, and acts the same between solutions of different density of the same substance. as between different substances. Solutions in water, of gum, gelatin, etc., increase in volume when opposed to water.

Each kind of matter has a tendency to diffuse itself through the pores or interstices of every other kind. And this tendency explains the solution of bodies. The various degrees in which this exists in different bodies accounts in part for many of the at first mysterious phenomena of physiology.

When a body is plunged into water it is either wetted or the reverse, according to its capacity for that fluid. If wetted, then its pores are saturated with moisture. This phenomenon is very simple, yet it is perfectly analogous to fundamental phenomena in the realm of physiology. This wetting is the first result of adhesion, or the first intimation of chemical affinity. That it is a result of chemical or physical affinity is shown by the fact that different substances act with different power. Thus while water will readily flow into the pores of chalk, mercury will not enter there at all, but is rather repelled. But while metals are really impervious to water, mercury will interpenetrate them.

Solids indicate various degrees of penetrability for water. A tube filled with glass, powdered very fine, will elevate water 170 millimeters, when the lower extremity is immersed in that fluid, while a tube containing glass, coarsely powdered, elevates it only 107 millimeters. This depends on the minuteness of the pores, by which a greater surface, and consequently a fuller action, is exhibited. It is evident that when the pores are large, the atoms of water occupying the central portion, do not come in contact with so large an extent of surface, and hence are not influenced.

This surface action of the pores is well shown by the filtration of liquids. Salt water passing through a column of sand becomes fresh, but if the current be continued, it at length flows through unchanged; for after the surfaces of the sand grains have attracted all the salt they can hold, they permit the remainder to pass unimpeded.

The exact reverse of this is obtained with some solutions, as carbonate of soda; the sand having a stronger affinity for the water than for that substance, the fluid flows out more concentrated than it enters.

The principle of the elevation of a fluid by a column of sand or powdered glass is the same as that of a capillary tube. The minute spaces or pores between the grains form a continuous, if tortuous tube, throughout their whole extent, up which the fluid is drawn. The hight to which it will ascend is limited by the size of the pores, as in a continuous hollow tube. The fluid will not aggregate and flow from the surface, for the reason that they are thus drawn up and held by the attraction of the interior of the pore or tube.

The central portion is never so much elevated. The pressure of the atmosphere accelerates, but does not otherwise affect the ultimate hight to which the column of fluid will ascend. The effect is the same in vacuo; nor does the hygrometric state of the atmosphere vary the result.

Elevation of temperature increases the hight to which a fluid will ascend, and also the rapidity. Heat increases the energy of affinity. Warm liquids are more readily absorbed than cold.

When a colored solution is dropped on a piece of chalk the water penetrates into the pores of the chalk, leaving the coloring matter on the surface; and this is not because the particles of the coloring matter are too large to enter the chalk. If fluid mercvry be dropped upon the chalk it will not be absorbed—it will not wet it; in other words, there is no affinity between the atoms of chalk and mercury. The phenomena here are the same as in capillary attraction; unless the fluid is capable of wetting the tube it will not be affected. Porous bodies, like tubes, imbibe fluids for which their atoms have attractions, and repel those for which they have not.

If an end of an open glass tube of small size be placed in water, that fluid will rise to a considerable hight; but if the tube be placed in the mercury it will fail to enter, and will be depressed below its external level. Not only are fluids and gases absorbed by porous bodies, but they are peculiarly affected in the act. When the pores are extremely minute, they exert a decided condensing influence, especially on gases. Spongy platinum, placed in a jar of hydrogen and oxygen, becomes bedewed with water produced by liquefying of these gases, *i, e.*, their union. Spongy platinum condenses 252 times its own volume of oxygen, and then has become a powerful oxidizing substance. Prepared charcoal exerts so strong an attraction that it completely removes the nitric oxides from solutions of lead, tartar emetic, ammoniated oxide of copper, chloride of tin and zinc. Charcoal will absorb the coloring of almost all organic substances.

All bodies, even the densest minerals and metals, are permeable to fluids and gases. Water may be used as a partition between gases, and is found to be one of the most permeable of substances. The water of lake and river contains common air, but this air contains one fifth oxygen; that of the atmosphere contains about one third. It is from this richness of oxygen that aquatic organisms derive their support.

Solution is an imperfect form or stage of chemical affinity, in which change of form occurs without change of properties. If water be added to an alcoholic solution of camphor, the latter is at once precipitated, for the alcohol has a greater affinity for the water than the camphor, and when a solution of salt in water is treated with alcohol, the salt at once crystallizes at the bottom of the vessel, thus showing that both were held in solution by chemical affinity.

The line of distinction between capillary attraction and chemical affinity is indefinite. Hence Clairaut's formula, "if the attraction of the particles of a solid for those of a fluid is more than half the attraction of these last for each other, the solid will be wetted; but if it be less than half, the solid will not be wetted."

Capillary attraction is not only related to chemical affinity, but also to attraction of cohesion. When two pieces of lead, on being pressed surface to surface, adhere; when two plates of glass become attached, or when a plate of glass adheres to the surface of water, one and the same principle is involved. But in the passage of animal fluids through membranous tissue, it must not be inferred that the latter exert no power. On the contrary, they act on animal substances in a flowing state, with the most varied results.

The processes of absorption, secretion, and excretion, while they are illustrated by the physical processes we have described, to which they are strictly analogous, and while they moreover involve physical laws, exhibit a character which precludes our considering them physical, and which distinctly distinguishes them from, and elevates them above chemical proceedings.

Such is the history of the phenomena of endosmosis. They are a series which are not physiological, but which are dependent on physical laws and the physical properties and relations of substances. They bear no nearer relation to the phenomena of physiological transudation than the descending flight of a swallow or an albatross does to gravitation. Undoubtedly, both alike involve the existence of physical substances and properties, since, if the body of the bird had no weight, it could not descend; and so also the liquids and secretions of the body could not permeate vessels unless the fluids had physical properties. But these properties are not what constitute the heart of the phenomena, nor can they be alleged to explain them. The physical side of the phenomena are made strictly subservient to other and higher processes than they are capable of. The essential conditions of absorption in animate organisms are a cell wall, whose composition is in great part water, and a fluid of animal substance. The products of digestion are animal substances in a flowing state, the composition of which, as food, was in large proportion water. This will pass through cell walls, or their interstices, not in virtue of the existence of defined passages or pores, but by displacing inwardly the particles of fluid already constituting a considerable part of the soft solid matter of the cell. Organic absorption commences and takes place in unison with prevailing organic actions. These are, the flow or progressive motion of the contents of the vessels that tend to draw into their own undisturbed current, soluble particles through extremely attenuate films of substance, interposed between fluid and current. Such films are cell walls. This is demonstrated by the fact that the power of different organs for absorption, depends on the number of vessels with which they are supplied, and the rapidity of the flow of their contents. This absorption, as in the case of the incoming of the products of digestion or soluble portion of food, is strictly organic, and is not to be induced under merely physical conditions; that is, where organic motions have come to an end, or where the tissues are exanimate. The readiness with which the fluid or watery portion of the contents of the blood vessels will leave them and infiltrate the tissues when the organism is really exanimate, attests the existence of condition during animation which held those fluids in their regular channel. The physiological refuses to be merged or swamped in the physical and chemical, while making both the latter subservient and ancillary to its own issues. The more we study the phenomena of each department, the more complete and inflexible becomes our assurance that the two latter phenomena are not convertible with the physiological. In view of a proper estimation of the facts, the ordinary and uniformly accredited designation of the ingress of oxygen into the capillaries of the lungs, and the egress of their carbonic acid into the air-vesicles, as a phenomenon of the diffusion of gases, seems far from the truth.—*Dental Cosmos.*

PRACTICE and persistence are the elements of the mechanic's success.

For the Scientific American.

METRIC SYSTEM.

In the year 806, in the first days of the month of May, near Aix-la-Chapelle, in the middle of a plain shaded by young poplars recently imported from Italy, numerous workmen were engaged in embellishing a magnificent tent of circular form, and being not less than one hundred and fifty cubits in diameter. Rich silken flags, representing the different countries conquered by Charlemagne, were hanging from each of the posts supporting the magnificent Turkish carpets which formed this elegant structure.

This tent was already filled with knights and deputies from all nations. Charles, on this occasion, intended to divide his empire among his three sons, Charles, Pepin, and Louis.

When the Emporor had arrived, seated on his throne, surrounded by his family and the principal officers of his kingdom, he rose, his aspect was imposing, his countenance thoughtful, open, but severe, recalling his German origin. He then spoke, and his words were repeated by interpreters standing in the middle of the representatives of each nation. After his speech, which was but an account, or rather a history of the first years of his reign, he caused his sons to be recognized as his successors, and having finished what he had to say respecting the settlement of public affairs, he turned toward his secretary, Eginard, saying: "It is your turn, my friend; speak to the learned men who are here present, and ask them for me if they have resolved the question I proposed to them last year."

This question was a very important and a very difficult one to solve. It was to find an imperishable unit of length. Charlemagne had already remarked that the ancient slade and cubit had no exactness.

The idea of giving to the nations of the earth a common measure, capable of being transmitted with exactness to the most remote posterity, was truly worthy of his genius.

Then, after Eginard had asked an answer from the learned men, a long silence prevailed in the assembly, notwithstanding the royal reward which the secretary had ready for the distinguished man who should find this wonderful unit. It was not timidity that kept those men silent, it was simply incapacity.

Understanding at last that this question was, if not insoluble, at least beyond the knowledge of his time, Charlemagne, after a moment of anger, stretched out his foot on the table before him, and ordered Eginard to measure it, which he did, including the shoe of polished steel worn at that time. This length named the king's foot was correctly marked inside of public monuments.

Charlemagne wished also that after his death his body and his shoes should be kept with care in a leaden coffin. "I do not think, said he, that after my death there will be a man so devoid of sense as to destroy or alter my mortal remains." In fact, no living being ever touched this celebrated foot, for even in 1793, when the French revolutionists in their fury sacked all the royal tombs, the king's foot was yet an object of veneration for the infuriated mob, and the leaden coffin was opened with great care. Alas! Time, not with his scythe, but with the help of his exterminating agents, the oxides, had destroyed not only the shoes, but even the bones of the monarch, and all was reduced to dust.

After the division of the kingdom of Charlemagne, the different States remained separated, and little by little the models of the king's foot have been lengthened by some and shortened by others, so that the true foot is lost.

If we take the English foot, or that of the United States, as a point of comparison, we find that the French foot is longer, and that of Spain shorter, and, indeed, we have as many king's feet as we have kingdom's in Europe.

In 1791, that is, 985 years later, the learned men of modern times thought of measuring the circumference of the earth in several countries. This difficult undertaking, the object of which was not only to ascertain the dimensions, but also the exact form of our globe was perfectly executed, and they took for unit of length the *meter* which is the ten-millionth part of the distance from the pole to the equator.

This meter, which can no more be lost than the earth which we inhabit, is equivalent in English feet to 0.3048 meter, and reciprocally a meter is equal to 3.28 feet, or 3 feet, 3¼ inches.

This meter determines the dimensions of the other units, which have new denominations and of which here is the table:

Are, unit of surface for land, is a square whose side is ten meters.

Liter, unit of capacity for liquids, is a cube whose side is the tenth part of the meter.

Stere, unit of solidity for wood, is simply a cube meter.

Gramme, unit of weight, imagine a small cube of water whose side would be the hundredth part of a meter.

Frane, unit of money, is a piece composed of nine parts of pure silver and one of copper, the weight of which is five grammes.

Thus all the units of weights and measures are derived from the meter which is the standard of this system.

To be able to form an exact idea of the absolute value of these new measures, we will compare them with measures that are familiar, thus: Meter, 3 feet, 3¼ inches; Kilogramme, about 2 lbs., 3 oz.; Liter, about 1½ pint.

Let us finish this article by an experiment which may be useful. We will add that if to a pin, A, we suspend a small ball, B, and that by shortening or lengthening the thread we succeed in making it oscillate sixty times in one minute, then the length of the thread from the pin to the center of the ball will be exactly 0.997 meter—very nearly one meter in the latitude of New York.

No. 4 E. Eleventh st., New York. M. VERGNES.

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Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

A Wonderful Turbine.

MESSRS. EDITORS:—On page 258, No. 17, current volume of SCIENTIFIC AMERICAN, you publish a communication from F. Wilber, on "Turbines and Water Power," who asks your opinion, or that of some of your readers, as to the possibility of a six inch turbine doing more work than two twenty feet overshots, as stated by parties using a "Leffel Turbine," in an advertisement to which he refers; in reply, allow me to say that the power of a turbine does not depend necessarily upon the diameter, but upon the quantity of water which it discharges, and which is commonly denominated "square inches of discharge," and which means the quantity of water which will flow through an opening of the given area, under the given head, without "contraction."

It is stated that one set of cards, one jack of one hundred and eighty-four spindles, two looms, etc., are driven by a Leffel turbine, under forty feet head, with three-fourths of a square inch of water. Now a vein of water of three-fourths of a square inch cross section, discharging under forty feet head, will give theoretically 1 2-10 horse power. The best turbines usually develop about eighty per cent. of the theoretical powers of a given quantity of water. Eighty per cent. of 1 2-10 horse power gives 96-100 horse power to do the amount of work stated, but which actually requires not less than four horse power. It is also stated that this wheel does double the amount of work that could be done with two twenty feet overshots, which were as good as were ever built; consequently they must have given seventy-five per cent. Therefore this turbine must have developed one hundred and fifty per cent. of the power expended. Again, eighty-four gallons of water per minute are stated by the parties to be furnished by their stream. A gallon of water weighs $8\frac{339}{1000}$ pounds, from which we have $\frac{84\times 8\frac{338}{1000}\times 40 \text{ ft. head}}{33{,}000} = \frac{848 \text{ H. P. theoretical effect}}{1000}$, 80 per cent of $\frac{848}{1000}$ H. P. is $\frac{678}{1000}$ H. P. to do the work stated. These, Messrs. Editors, are the facts of the case from which your correspondent and the public will see that this wheel, according to figures which "cannot lie," is developing from one-and-a-half times to more than three times the amount of power there is in the water itself. A most remarkable achievement and worthy the attention of all desiring great economy of water! CHAS. E. FOWLER.

Carmel, N. Y.

Prevention of the Musketo Pest.

MESSRS. EDITORS:—In a recent number of the SCIENTIFIC AMERICAN I noticed an article entitled "The Musketo Pest," with an invitation for suggestions of means of defense against these insects. "Persian Insect Powder" and Carbolic Acid are mentioned as remedies, but in either of these cases many would consider the remedy worse than the disease. The only remedy is the exclusion of the musketo from the dwelling. This is attempted by a fine netting stretched over the windows and doors. These are of various fabrics, cotton being the material chiefly employed. But the fibers of cotton, even if sized or starched, will spread themselves across the interstices of the netting and prevent the cooling currents of air from entering; and they are easily torn, when they become valueless for the purpose intended. I have tried the various kinds of musketo netting, and find that the only proper material is wire cloth. It not only excludes all insects, but, the material being smooth, permits the air to pass freely between the meshes. They can be made plain, or so woven as to present agreeable patterns and pictures to the eye. Such screens should be kept in stock by upholsterers.

Clinton, Mass. G. F. W.

Occult Properties of Numbers.

MESSRS. EDITORS:—Permit me to add to the examples of "extraordinary coincidences" mentioned in the current volume of your valuable journal first on page 227, and afterward continued by Mr. Konvalinka on page 259.

As a professed believer in the occult properties of numbers first expounded by Pythagoras, the number 27,648 has been the object of some study by me. In the first place it is exactly equal to the series $1^1\times 2^2\times 3^3\times 4^4$ and as I believe "that such a remarkable coincidence can not be merely accidental, it must have some deeper foundation in the mysteries of astronomy," such, for example, as the number in which the vast cycle of the precession of the equinoxes is completed. It is true that astronomers do not make the years exactly those I have given, although very nearly identical; so nearly, in fact, that we may well suppose the difference to be due either to imperfection in apparatus or to some "personal equation" or other in observation, for you will notice that the first two digits (27) is a cube ($=3^3$) and the last digit (8) is also a cube (2^3) that the middle digit is twice the cube root of 27 and that the other digit (4) is twice the cube root of 8 and that finally the sum of all the digits is exactly equal to the two first (27) whose cube root is 3 and whose sum is 9 the square of 3

If now the order of the digits is reversed it becomes 84,672 which contains the original number exactly $4\frac{9}{16}$ times. Both terms of the fraction expressing the ratio are perfect squares, which are contained a whole number of times in the reversed qnantity and their square roots ($\frac{7}{4}$) differ exactly by that constantly recurring number 3, the terms (49—16) differ by 33 Again the 84,672 is divisible without a remainder by the squares of all the digits except 5 and 9, that is, by $1^2\,2^2\,3^2\,4^2\,6^2\,7^2\,8^2$ and also by the cubes of 1 2 3 and 4. The sum of all the digits $8+4+6+7+2=27$ the cube of 3 the first two digits (84) minus the last two (72) is exactly twice the middle digit (6) the exact difference of the first (8) and last (2).

The sum and the difference of 84,672 and 27,648 are 112,320 and 57,024 which can be shown to possess remarkable properties but I forbear to speak of them as well as of several properties of the other numbers having made this communication as long as I dared. WM. G. LEONARD.

Cincinnati, Ohio.

Diagram of the Day Line.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN (Vol. XVII., No. 16, page 246) you say that a Mr. Lyman Thayer, of Burlington, Vt., has invented an admirable device for illustrating the day line, etc., and also for telling the relative time of any two points on the earth's surface. Now I have not seen Mr. Thayer's diagram, but the one herein inclosed (completed a month ago) I suppose to be very similar. It, however, is by no means exact, but is only intended to give an idea of the invention. I have taken for the day line the 180th meridian from Greenwich. It can readily be seen that a similar diagram can be made of the southern hemisphere, and also that the device can be applied to all maps, to tell

the difference of time between any two points represented on the map. I should have written sooner on this matter, but was waiting until I could finish a large and accurate diagram to send you.

If the 180th meridian be taken as 12 o'clock, 15° E., or the 165th meridian W., represents 1 o'clock, and 15° W., or the 165th meridian E., represents 11 o'clock, etc. According to this I propose to number each meridian, allowing of course 4 minutes to the degree. Any meridian may be taken as 12 o'clock, but this alters all the others. W. R. SHELMIRE.

Philadelphia, Pa.

LENHART'S SPRING FISH-HOOK.

The engraving accompanying this description represents a device for contravening the proverbial want of success of fishermen. It is a double hook, one, A, being the bait hook, and the other, B, the securing hook. Fig. 1 shows the hook

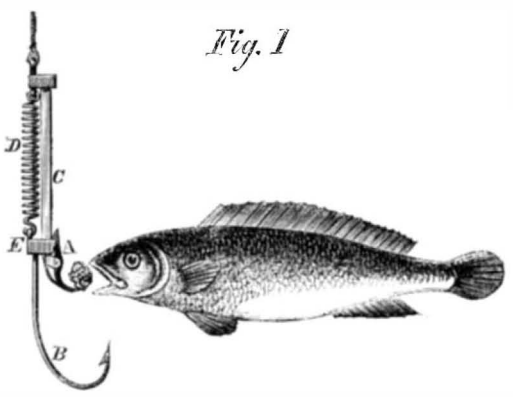

Fig. 1

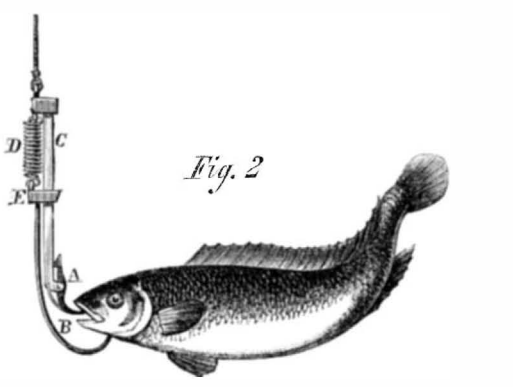

Fig. 2

ready for use and a fish about to take the bait, and Fig. 2 the hook sprung and the intended result. It is a combination of two hooks, connected in a light frame, the smaller or bait hook being pivoted to the bar, C, at its lower end, and the larger or securing hook attached to the spiral spring, D. By pulling down the large hook the slide, E, is engaged with the hook, A, which has a catch on its back and a light spring to throw the catch in place. A slight pull on the small hook, or such a disturbance as may be made by a "nibble," must disengage it from its catch and allow the spring, D, to act, when the fish is held by the larger hook, as seen in Fig. 2. To disengage the fish and to bait the hook anew, the larger hook is pulled down by one hand, while the other holds the top of the bar. It appears to be cruel to the fish—a consideration which probably has little force with anglers—but, unless carefully used, may also be dangerous to the fisherman. A patent for this device is now pending through the Scientific American Patent Agency. All communications should be addressed to the inventor, A. I. Lenhart, New Brunswick, N. J.

Imperfection of Malleable Iron.

It has for some time past been known, that the fibrous nature of iron, long considered an element of its strength, is in reality, due to the presence of foreign matters, which are taken up during manufacture, and prevent the adhesion of the adjacent particles of the iron, however carefully or powerfully the metal may be compressed, or however it may be twisted, doubled up, or contorted. The effect is similar to that which occurs with a glass tube hermetically sealed at both ends; however it may be drawn out, however often it may be doubled or twisted together, at even a very high temperature, the air, a foreign substance within it, will prevent the union of its particles, and cause it to have a fibrous appearance, without adding to its strength, but the contrary.

The imperfection of malleable iron from this cause has now been found far greater than was suspected. It has been shown, by experiments made on French and English armor-plates, that, however homogeneous they may seem when cut and polished, whether formed by the rollers or the hammer, they consist of laminæ not at all welded together, and presenting an appearance similar to that of a number of sheets of paper. This condition has been revealed unmistakably by the effects produced by projectiles; and it is found to be present even when the plate has been both hammered and rolled at a welding temperature.

This discovery assumes a still more serious character, if possible, when there is question of such forgings as railway axles, screw shafts, the shafts of marine engines, and other portions of machinery, the soundness of which is of vital importance. It explains the difficulty of constructing large forgings of requisite strength; and leads, unfortunately, to the conclusion, that without fusion, as in the case of steel, there can be no adequate security with regard to the homogeneity, and therefore the strength of the material.

The intense heat employed in the manufacture softens the scoriaceous matters, but they are never expelled. This is true, to a greater or less extent, even with charcoal iron. The only advantage possessed by the charcoal iron, in this respect, seems to be that the laminæ do not separate during fracture under the blow of a projectile, which is a most trying test of the amount of their adhesion.

It is worthy of notice that the laminæ are more distinctly perceptible, the better the iron, and the more capable of resisting fusion at high temperatures. Fusion seems to be an indispensable condition for the prevention of a laminated structure; hence the excellence of metal such as steel, which is subjected to fusion during manufacture. When fusion has taken place, the rolls and the hammer impart new and valuable qualities. The so-called fibrous character of iron causes its practical to be far less than its theoretical power of resistance; and when it begins to give way in the shafts of marine engines, etc., the fracture commences along lines of junction of the laminæ; and the results of numerous experiments seem to show that, while the welding is very imperfect in those portions to which the shock of the hammer cannot reach, it is in all more or less faulty.—*The Scientific Review.*

A Singular Fact.--The Effect of Variable Calibers in Foam Pipes.

It is known to engineers that some practitioners believe that running a pipe from the steam space to the water space, outside the boiler, and attaching their gages thereto, will give them notice of foaming, or priming, and assist in the prevention of these annoyances. We have a letter from a Maine correspondent who says, that on the Portland and Kennebec railroad is a freight engine which has a "foam pipe," tapped into the top of the boiler, running down, and tapped into the leg-water space of the fire box, just above the foot board; which leaves the pipe about three feet long. Into this pipe a water gage is fitted. When the steam is on and the throttle opened, the water in the boiler rises a little, of course; but in the gage it falls at the same time nearly two inches. Still, when the gage was closed the glass would show the two inches of water.

This case, if we can understand it from the letter of our correspondent, is a curious one, but not singular. We have seen but one case similar, but have heard of one other. In both these cases the holes tapped in the steam space and in the water space were at first of varying diameter; that in the steam space being much smaller than that in the water space. In the one case, where the upper hole was half inch and the lower three-fourths, we failed to get a reliable water level on the gage. In the other case the experimentor finally got a reliable gage by making both holes of the same caliber. The "reason why" we confess we do not understand. We have our theory, but prefer the evidence of those who have investigated more fully than we did.

THE NOVEMBER METEORS.—Just one year ago the public mind was much exercised at an expected display of celestial pyrotechnics which astronomers predicted would be of unusual brilliancy. Disappointed on that occasion, it is hardly to be expected that the same enthusiasm will be exhibited this year, although it is possible that the shower may make its appearance. In the year 1832, the inhabitants of Europe were favored with a meteoric display, which on the succeeding year delighted the American population. Last November the Europeans were again favored, and certain astronomers are confident that the present month will witness a repetition on our side of the water.

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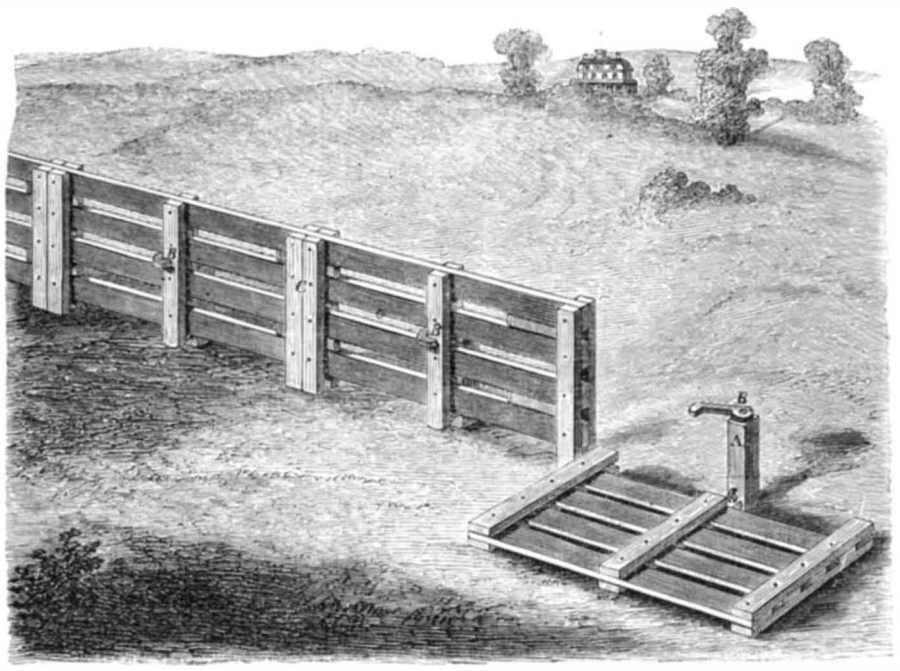
Improved Fence for Submerged Lands.

Throughout the country there are alluvial lands, which, while possessing a rich soil, are kept from yielding any benefit to the cultivator by the certain, or uncertain, contingency of an annual overflow. In many cases dyking is too expensive a process, and when an overflow or freshet occurs, fences, and even outhouses and barns are swept away by the flood. To protect fences, under such circumstances, from being carried away by the flood, is the object of the device illustrated in the engraving.

The permanent posts are quite low, as seen at A, and are firmly seated in the ground. The sections of fence are linked or hinged to these parts, and held in an upright position by means of a latch or catch, B, either of wood or metal, pivoted to the top of the post, and engaging with the middle upright of the section. The sections are secured one to the other by means of wooden keys, or wedges, seen at C, which lock the line together and make a secure and rigid fence. The short posts sustain the whole weight of the fence.

When the water rises, and there is danger of a destructive overflow, the keys may be driven out and the fence be allowed to fall flat on the ground, the sections being prevented from being carried away by their connection with the posts. The prostration of the fence need not be effected until the water is half way up the hight of the fence, when the work can be done by means of a boat. It is evident that in some situations such a device would be invaluable.



BOWLUS' LAY-DOWN FENCE.

It was patented through the Scientific American Patent Agency, Aug 20, 1867, by L. H. Bowlus, who may be addressed relative thereto at Knoxville, Tenn. The entire patent, or State rights for sale.

Lapis Lazuli.

The name of this mineral is derived from the Persian language, and means blue color, or, with the Latin prefix, blue stone. The ancients were well acquainted with it, and have employed it as a substitute for other gems. The Greeks and Romans are said to have called it by the name of sapphire, denominating that with specks of iron pyrites the *sapphirus regilus* ; Pliny called it the *cyanus*. It was formally used as a strengthening medicine.

Lapis lazuli very seldom occurs crystallized ; its regular form is the oblique four-sided prism ; it mostly occurs compact, and in grains and spects, with an uneven and conchoidal fracture ; it is translucent on the edges ; its luster is nearly vitreous and shining ; structure foliated ; its color is fine azure blue, with different shades, often interspersed with spots and veins of pyrites. It scratches glass, but is attacked by quartz and by the file ; its specific gravity is 2·3 ; before the blowpipe and on charcoal it with difficulty runs into a white glass, but with borax it fuses with effervescence into a limpid glass, It consists of lime, magnesia, and silex, with soda, protoxide of iron, and sulphuric acid.

It is generally called in trade, the Armenian stone.

It is found in gangues of the older formations, and in Bucharia ; it exists in granite rocks, and is disseminated in all veins of thin capacity ; on the Baikal Lake it is found in solid pieces ; also, in Siberia, Thibet, China, Chili, and Great Bucharia. Lapis lazuli is much used for jewelry, such as rings, pins, crosses, ear-rings, etc. The best pieces are generally cut out from larger lumps by means of copper saws and emery, then ground with emery on a lead wheel, and polished with rotten stone on a tin wheel. The rocks which yield lapis lazuli, where it is contained in specks, are likewise cut for ornamental purposes, such as snuff-boxes, vases, candlesticks, cups, columns, cane-heads, etc. ; also, for architectural ornaments and stone mosaic ; the larger specimens, having specks regularly disseminated on a white ground of the rock, are those selected for cutting. The most important use of this mineral is that of furnishing the celebrated and beautiful pigment called ultramarine blue, used by painters in oil, and said never to fade. The lapis lazuli takes a very high polish, but becomes dull again after being used for some time. It is sometimes imitated by lazulite (azure stone), or blue carbonate of copper, which, however, is not near so hard, and effervesces on testing with nitric acid. Those specimens having iron pyrites inclosed are difficult to polish well, on account of the unequal hardness of the two minerals.

Lapis lazuli has lately been discovered in California, but the color of the mineral from this locality is very indifferent, and its price is therefore much inferior to that from Persia.

The value of lapis lazuli, although depending upon its purity, intensity of color, and size, has nevertheless much diminished when compared with its former prices.

The Chinese, who have for a long time employed lapsis lazuli in their porcelain painting, call the pure and sky-blue stone *zuisang*, and the dark blue, with disseminated iron pyrites, the *tchingtchang*, preferring the the latter to the former ; they work the same for many ornaments, such as vases, snuff-boxes, buttons, and cups. In the palace which Catharine II. built for her favorite, Orlof, at St. Petersburg, there are some apartments entirely lined with lapis lazuli, which forms a most magnificent decoration.

The process of preparing ultramarine was known as early as the fifteenth century. The color is now mostly prepared at Rome, in the following manner: those pieces which are free from pyrites specks, are first calcined and pulverized ; the powder is then formed into a mass with a resinous cement (*pastello*), and fused at a strong heat ; this is then worked with the hands in soft water, whereby the finest coloring particles are disengaged in the water, which will soon be impregnated with the blue color ; a fresh portion of water then taken, and the same operation is continued until the remains are colorless. The ultramarine, after a short time, settles to the bottom of the vessels and is carefully separated and dried. If the lapis lazuli be of the best quality, the product will be from two to three per cent. That color which remains yet in the mass is of an inferior quality, and is called the ultramarine ashes ; it is of a paler and more reddish color.

Good ultramarine has a silky touch, and its specific gravity is 2·36. It does not lose its color if exposed to heat, but is soon discolored by acids, and forms a jelly. In order to distinguish the pure ultramarine from numerous spurious and adulterating coloring materials, such as indigo, Prussian blue, mineral blue, etc., it is only necessary to test the article in question with some acid, when after a few minutes the real ultramarine is discolored, yielding a clear solution and a white residuum. The real ultramarine has always been at a very high price, on account of the small product obtained from the mineral. An ounce of the purest ultramarine is sold in France for two hundred to two hundred and fifty francs, which is not within the reach of all painters.

In the year 1828, the discovery was made by Professor Gmelin, in Tubingen, that sulphuret of soda was the proper material for imitating this precious and valuable pigment. By his experiments he succeeded in preparing this substance from silex, alumina, soda, and sulphur, producing a color in every respect corresponding with the true color of the lapis lazuli, and bearing the same relation to acids as the genuine ultramarine. This, for economy, has become a great object to painters and color men, since a whole pound of it may be purchased in France for twenty francs. As it bids fair to meet with a great consumption, being even substituted for cobalt in bluing paper, thread, and other stuffs, several manufacturers have already been induced to engage largely in its preparation ; and there is now a very extensive establishment in full operation by M. Guimet, three leagues from Lyons, who likewise claims the priority of its discovery : the royal porcelain manufactory at Meissen, in Saxony, also prepares it. The process for making the artificial ultramarine, as it was first described by Gmelin, is here given, as it was published in the *Annales de Chimie.* The whole process is divided into three parts :

1. The pure hydrate of silica is prepared by fusing fine pulverized quartz or pure sand with four times its own weight of salt of tartar, dissoling the fused mass in water and precipitating by muriatic acid ; also the hydrate of alumina is prepared from alum in solution, precipitated by ammonia.

2. Dissolve the silex so obtained in a hot solution of caustic soda, and add to seventy parts of the pure silex seventy-two parts of alumina ; then evaporate these substances until a moist powder remains.

3. In a covered Hessian crucible, a mixture of dried sal soda, one part to two parts of sulphur, is heated gradually, until it is fully fused, and to the fused mass add small quantities of the earthy precipitate, taking care not to throw in fresh quantities until all the vapors have ceased ; after standing for an hour in the fire, remove the crucible, and allow it to cool. It now contains the oltramarine, mixed with an excess of sulphuret, which is to be removed by levigation ; and if the sulphuret is still in excess, it is to be expelled by moderate heat. Should the color not be uniform, levigation is the only remedy.—*Feuchtwanger.*

Science Familiarly Illustrated.

Leeches.

This animal has had a reputation from the earliest periods of medical science. Even from the time of Homer, the appellation of leech was given to the practitioners of the art of surgery, and in many of the languages of German derivation the word signifying a physician is identical with that given to the leech. From an English exchange we gather the following facts relative to the life and habits of this species of aquatic worm, which is indeed among the lowest classes of the animal chain of being :—

"There are about thirteen or fourteen species of the leech, some of which are found in most parts of the world ; but the medicinal species is best known, and abounds in various parts of the world—as America, Russia, Hungary, Spain, Portugal, in the marshy plains of Egypt, and in various parts of Asia. It belongs to the class *annelides*, or ringed worms, its body being composed of a series of rings, or circular muscles, by the successive contraction of which it moves along either in the water or upon the surface of leaves, reeds, or other solid bodies. The tail extremity is in the form of a cup, or sucker, by which it adheres firmly to flat substances, on the same principle as a boy's leather sucker adheres to and lifts up a stone. The mouth is also in the form of a sucker, and is, moreover, furnished with three cartillaginous teeth, placed so as to form with each other a triangle. When examined and felt with the point of a finger, they seem soft and blunt ; but the animal, when about to pierce the skin, seems to have the power of erecting them into firm, sharp-edged lancets, which saw through the integuments in a single instant, and almost without inflicting any pain. Having made the puncture, the blood is extracted by a process of suction, and is passed through the œsphagus into the stomach, or rather stomachs, of the animal, which consist of a series of communicating cells, that occupy the greater part of the interior of its body. The leech having thus gorged itself to the utmost, if undisturbed, remains in a half-torpid condition till it has digested its gory meal, and not unfrequently dies of the surfeit. If it survives it will be greatly increased in size. They can live for months and years on what appears to be pure water alone. This forms the singular circumstance in the diet of these animals. They delight to gorge themselves with a full meal of blood, even to surfeit ; and yet with plain water they live, grow, and seem to have the greatest enjoyment of existence. It would appear as if their three lance-formed teeth, and their carniverous appetites, were bestowed more for the benefit of man than for themselves, and that, in their system of dietetics water is the rule and blood the exception.

The medicinal leech is a native of many parts of Britain, but is now becoming very rare. France is supplied chiefly from Strasburg, whence they are imported from Hungary, Turkey, Wallachia and Russia, and kept in ponds. They are carried into France on spring wagons, and are contained in moistened bags, each bag containing 120 leeches. Previous to 1834 upward of 46,000,000 of leeches were imported into France annually. At present the numbers have decreased to 17,000,000. They are imported into London and Leith by sea, packed in little bags, which are occasionally moistened with water during the short voyage. In general they arrive fresh and healthy ; but they are not unfrequently liable to disease, which destroys great numbers. There are three sorts, or sizes, the largest and middle sorts being reckoned the best. A large leech is calculated to abstract half an ounce of blood, besides the quantity which flows from the wound afterward. The smaller sizes are comparatively inefficacious.

A common animal in the pools of this country is the horse leech. It nearly resembles the other, but is of a more uniform color, and not so decidedly marked with greenish streaks on the backs as the medicinal species. The horse leech has no great inclination to fasten on the human skin, but when it does so it takes its fill, just like the other, and no more. There is a popular but unfounded belief that if a leech of this description do fasten on the skin, it will continue to suck and discharge the blood till every drop in the body is exhausted. Hence they are the dread of every school boy who happens to wade with naked legs into their dominions.

The leech, like many other animals, appears to have a very nice sensibility in regard to atmospheric changes, and especially what regards the electric modifications of the air. Before storms, or any sudden change in the atmosphere, the leech is seen in great activity, and darting up to the surface of the water in its jar. These animals, too, at certain times, are found to move out of the water, and remain for a considerable period clustered on the dry upper surface of the jar ; while on other occasions they will remain for days immersed in the water near the bottom. They produce small eggs, which form into cocoons, from which in due time the living young make their appearance.

Grindstone Grit as a Substitute for Fire Brick.

Mr. Ludwig Wolf, who has charge of a number of the tempering furnaces in the ax factory at Collinsville, Conn., says that "noticing the great amount of fire brick required to keep them in order, I thought of using grindstone grit—of which we have a large quantity—knowing the adhesive quality of the grit. I tried it, and found it to work well. It does not last so long as fire brick, but it keeps the fire cleaner than the brick, and does not form clinkers so fast. I do not know if it will work as well in fires where a heavy blast is required, but if it will it is cheap enough, as for other purposes it has little value."

Silica is the principal ingredient of grindstone grit, together with oxide of iron. It would appear to be well adapted for lining such furnaces as our correspondent manages.

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MANUFACTURING, MINING, AND RAILROAD ITEMS.

Figures at the Hydrographic office show that the power at Rumford, Me., on the Androscoggin, due to the known hight of the fall and the estimated volume of water, is not less than 15,644 horse-power at low water.

The Western Union Telegraph company, have completed their lines, so that Helena, Montana, is in communication with New York.

The California papers announce new discoveries of asphaltum near Wilmington, Los Angeles county, some of which comprise many acres. A company has of course been organized and they propose to make thorough tests of the new acquisition, relating to its value as a fuel.

A Wisconsin wine manufacturer had 5,000 pounds of grapes frozen last year. This year he made wine from them which proved to be 100 per cent better than that made from grapes not frozen.

A ship canal through the Florida peninsular is advocated by the Southern newspapers. Such a canal would be less than a hundred miles long, and greatly shorten the journey from New Orleans, to New York, and be the means of avoiding the dangers of the Florida coast.

A sugar refinery in London has one of Wilde's electro-magnetic machines, driven by a 15-horse power engine, employed in the refining of sugar, it having been demonstrated that a stream of electricity driven through a solution of brown sugar would bleach it, much better even than charcoal.

The total length of railroad necessary to connect San Francisco with New York is 3,300 miles. The cars are now running over 1,985 miles or a little more than half way.

Extensive works are under way in San Francisco for the manufacture of lead on a large scale. The supply of ores is very abundant and generally sufficient silver is in combination to pay for transportation and extraction.

The Central Pacific Railroad earned over $200,000 in October with less than 100 miles in operation from Sacramento to Cisco.

Passengers on the Pacific railway, E. D., between Ellsworth and Hays last week witnessed an exciting encounter between a herd of buffaloes and the express train. For three miles the buffaloes pushed along parallel with the train and although many shots were fired nothing could stop the tide of the stampeding beasts. Finally they swept across the track ahead of the locomotive, fairly worsting the iron horse by bringing him to a halt.

L'Evenement, of Quebec, says that an immense deposit of black iron sand has been discovered on the banks of the St. Lawrence, near Batiscan.

The exhibition of the first bar of American tin at the St. Louis Fair has had the effect of increasing public confidence in the Missouri mines. Owners of land are not disposed to sell on large advance over their purchase price. Mining operations are progressing, though slowly, and large furnaces are being completed and will be running as soon as possible.

The plan is meeting with favor in England of instituting a system of accidental insurance for miners, the mine owners paying the premiums and insuring the men, while on the other hand the companies are to issue policies not to each individual by name but for such a number of strikers, boys, etc., employed. The individual miners might come or go without affecting the policy, and in case of fatal accident in the mine the insurance would be paid without reference to identity of the victims but according to number and rank.

From the great scarcity of fuel, steam engines have never been introduced for pumping in the silver mines of the Hartz mountains, but with an excellent system of races and reservoirs the water is got rid of by water wheels and turbines. The mines having reached a depth of 3,200 feet, adits were from time to time driven to lessen the labor of the machinery, but at last a point was reached which threatened the total suspension of the work and loss of employment to 2,500 miners and smelters. Eight years ago, as a last resort, surveys were made and a tunnel commenced for draining still deeper. This undertaking is finally finished, and has satisfied all expectations. Its length is 22 miles, and so exact were the surveys that in the 18 ends (one mile from each other) the bearings were but five inches out of reckoning for the whole length. Great rejoicing succeeded the completion of the work, a solemn thanksgiving in the Lutheran churches, processions, etc. It is now certain that the mines can be carried on until the year 1887. They were first worked in the year 926 and have been productive ever since.

Immense works have just been commenced in the south of France for rendering the Rhone navigable from Arles to the sea. Three miles of large sand banks which now completely block the river, are first to be removed; the Canal St. Louis must be extended two miles, a lock be erected at the mouth, and other improvements which will cost in their undertaking eight million francs. In the same province they have also begun draining the marshes and improving the state of the Camarque, a sort of island formed by the two branches of the Rhone.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

IMPROVED SYRINGE.—Jas. J. Essex, Newport, R. I.—This invention relates to a new and improved syringe, which is applicable to all purposes for which a syringe is required, and which consequently may be termed an "universal syringe,"—it being capable of being used as an enemata apparatus, or as a double syringe and is portable and capable of being adapted for use in a moment of time. This improved syringe is of the modern class in which the pump (cylinder and piston) is dispensed with, and an elastic belt used instead. The invention consists, 1st, in a receiver, or reservoir, provided with a glass, or transparent plate, inserted in its side, so that when the device is used for enema-giving purposes, a precise quantity of liquid may be used, to wit, a gill, pint, etc, as may be required, and this receiver, or reservoir, is designed to accompany the apparatus, and form a part of the same. The invention consists, 2d, in a rose, or perforated nozzle, which is termed a "douche," whereby wounds may be irrigated with a delicate spray of warm or cold water, as may be required. This device is also valuable for cleansing or washing the eyes. The invention consists, 3d, in using in connection with an elastic bulb, as a suction and force pump, an elastic and metallic tube, placed at or attached to opposite ends of the bulb, and using in connection therewith an air chamber, all being so arranged that a continuous stream may be thrown from the eduction tube, and the device adjusted to suit the various uses required of it. The invention consists, 4th, in a novel and improved arrangement of packing, whereby perfectly tight joints may be obtained.

HAND HAY RAKE.—Albert J. Greene, Sterling, Mass.—This invention has for to object to furnish an improved hand rake, simple in construction, easily operated, and which will do its work well.

POINT FOR PRINTING PRESS.—Nicholas Hopkins, New York city.—This invention has for its object to furnish an improved device for the purpose of making holes in printed sheets, preparatory to their being folded into book form by machinery, said point holes being necessary to insure perfect register.

APPARATUS FOR CLEANING STOVE PIPE.—A. W. Smith, Pierpont, N. Y.—This invention has for its object to furnish an improved means, by the use of which horizontal stove pipe may be readily and quickly cleaned, without its being necessary to take down the pipe and soil the room.

BARN DOOR AND GATE FASTENER.—Lorenzo B. Hayes and Wm. Morris, Greene, N. Y.—This invention has for its object to furnish an improved fastening for barn doors, gates, etc., cheap, durable, and simple in construction, which will fasten the door both open and shut automatically, securing it at top and bottom, and which may be adjusted to compensate for the sag of the gate or door.

EXTENSION TABLE.—F. R. Wolfinger, Chicago, Ill.—This invention has for its object to improve the construction of F. R. Osgood's extension table, patented January 2, 1866, and numbered 51,855, so as to make it capable of a greater extension, while occupying no more room when folded.

HORSE HAY FORK.—Mark Coffin, Milton, Ky.—This invention has for its object to furnish an improved horse hay fork, simple in construction, easily operated, not liable to get out of order, and effective in operation.

BALING PRESS.—Joseph P. Taylor, Hudson City, N. J., and Jackson R. Baker, Jersey City, N. J.—This invention has for its object to furnish a simple compact, convenient and powerful baling press, and one which shall at the same time be easily operated.

ATTACHING WHEELS TO AXLES.—L. Crouch, Baraboo, Wis.—This invention has for its object to improve the manner of attaching the hubs of wheels to their axles, so as to make their connection more secure, convenient, and less liable to get out of order.

CORPSE PRESERVER.—Charles W. Compton, Newark, N. J.—This invention has for its object to furnish an improved corpse preserver, so constructed and arranged as to be easily and conviently handled and operated, economizing time, labor and ice.

DEVICE FOR SUPPORTING WINDOW SASHES.—Joseph R. Payson, Chicago, Ill.—This invention consists in an automatic or self-acting friction wedge placed either in the side of the window frame or in the edge of the window sash and constructed and arranged in such a manner that it will support the sash in any desired position within the scope of its movement by friction and act more powerfully when the sash is stationary or while it is being lowered than when it is being raised, but still admitting of the sash being either raised or lowered by the pressure of the hand upon it alone, no other manipulation being requisite. The device is concealed from view, holds the sash square in the window frame and prevents it from rattling.

REVERSIBLE CHAIR SEAT.—Mathias Hamburger, New York city.—The object of this invention is to so arrange the seat of barbers' and other chairs that the same can be easily reversed so that every new occupant may be provided with a fresh and cool seat.

LUBRICATING CARRIAGE AXLES.—Edrick Thomas, Kickapoo, Ill.—The object of this invention is to lubricate carriage axles without removing the wheels from the axles. To this end the invention consists in boring a hole in the hub directly back of the spokes and inserting a tube to receive a bolt or plug, the metallic box of the hub being tapped and the hole closed by the bolt or plug when the latter is inserted in the hub. In order to lubricate the axle the bolt or plug simply requires to be removed, oil poured into the tube and the latter filled or stopped by inserting the bolt or plug.

LAMP FOR CAR AND OMNIBUS FARE BOX.—John B. Slawson, New York city.—This invention relates to a new mode of arranging the lamps which are provided in omnibus or car fare boxes. The object of the invention is to so place the light in the box that it will not blind the driver's eyes and that it will illuminate the trap upon which the money falls when thrown in by the passengers. The object of the invention is also to adapt the lamp to fare boxes already in use so that the box need not be changed.

MACHINE FOR SHARPENING HORSESHOES.—Wm. M. Butler, Waukegan, Ill.—This invention relates to a machine by which the calks of horseshoes can be quickly and easily sharpened without taking the shoe off the horse's foot; the device operating so that a whole span of horses can be completely sharpened in about twenty minutes.

COMBINATION HINGE.—Antonio L. Mora, New York city.—This invention relates to a new and improved device for supporting in any required position the covers of trunks, chests, desks, boxes, and all articles of similar construction.

DOUBLE PLUNGER PUMP.—George Shield, Cincinnati, Ohio.—This invention consists in forming the pump barrel in two parts and in using two plungers one a solid or closed plunger and the other a shell or open plunger.

STEAM AND WATER ENGINE AND PUMP.—E. McClintock, New Brunswick, N. J.—This invention relates to a new and improved method of constructing and arranging the parts of steam and water engines and pumps whereby the power may be applied to the piston in the simplest and easiest manner, and the invention consists in employing two double-acting cylinders in each of which cylinders the piston acts as a four-way valve for the distribution of steam or other fluid or liquid for the other cylinder.

DEVICE FOR HAKING BRICK.—Daniel Woodbury, Minneapolis, Minn.—This invention consists in the construction of a machine by which a number of bricks may be taken from the yard (where they have been deposited from the molds to dry) and carried by hand to and arranged in the pile called by brick makers a "hake."

MACHINE FOR CUTTING TUBES.—Nicholas Thomas, Chicago, Ill.—The object of this invention is to furnish a machine or tool for cutting off the end of boiler tubes or tubes for other purposes and the invention consists in arranging in a suitable stock a cutting tool which is forced outward with a screw by means of a double inclined plane.

STEAM AND VAPOR CYLINDER.—Alexander Webster, Seneca Falls, N. Y.—This invention relates to the use of steam or vapor in the process of dressing woolen and other clothes and in other processes and for other purposes and it consists in adjusting a perforated steam pipe in a perforated cylinder with suitable provision for the discharge of the water of condensation.

SALT AND PEPPER SPRINKLER.—George W. Putnam, Peterboro, N. Y.—This relates to an invention for sprinkling salt, pepper, etc. In this invention the holes are made on one side of the cap or cover, and the bottle is held horizontally when used. This prevents clogging as the weight of the salt, etc., cannot press against the portion nearest the holes the weight being supported by the side of the bottle.

COMBINED CARRIAGE AND CRADLE.—C. W. Higgins, Waukesha, Wis.—This invention consists in so hanging or attaching the body of a child's carriage to the axles of the same that it can be readily attached and detached at pleasure, and in providing such body with rockers so that when detached it can be rocked upon the floor whereby a combined carriage and cradle is produced.

MEANS FOR DEPRIVING WOOL OF ELECTRICITY.—George R. Gardiner, Westerly, R. I.—This invention consists in certain means employed for preventing the development of electricity during the condensing operation, whereby a great amount of stock is prevented from being wasted and the condensing operation greatly expedited.

BLACKING BRUSH.—George R. Burden, Waltham, Mass.—This invention relates to that class of such brushes as are provided with two brushing surfaces the one for applying the blacking to the boot, and the other for rubbing and polishing the boot after the blacking. The invention consists in attaching or securing to the back of a blacking brush in any suitable manner to be readily detached, a box or receptacle of blacking, and in so hanging the brush on the same side of the blacking brush thereto that it can be swung over to and upon the blacking in the box, for being coated or provided therewith when being swung back to its original position it will be so held that the blacking contained on it can be applied to the boot or shoe.

CAR WHEEL.—John Harris, Marquette, Wis.—This invention relates to an improvement in the construction of railroad car wheels for lubrication of the parts while at the same time they are held together solidly.

WAGON BRAKE.—Ezra N. Curtice, Spring Water, N. Y.—This invention relates to an improvement in the construction and arrangement of a brake on a wagon and consists in attaching a rocking brake shaft to the hounds and reach in front of the wheels on the ends of which are eccentric arms or projections on which are loosely hung the brake shoes or rubbers in such a manner that they shall bear against the wheel to operate them and shall be free from pressure on the wheel when the brake is not required.

STEAMBOAT PADDLE WHEELS.—E. C. Smith, Old Ripley, Ill.—This invention relates to an improvement in the construction of paddle wheels for propelling steamboats, and consists in attaching fixed eccentrics upon the frame, having loose revolving collars around them, which are connected with the paddles by jointed arms, in such a manner that upon each revolution of the wheel the paddles dip perpendicularly, as they descend into and rise with the water, and thus present a constant resistance at right angles to the line of the horizon.

DOOR LOCK.—Michael Knapp and John Knapp, Hudson city, N. J.—This invention relates to a door lock, in which iron bolts are used, the main bolt being locked by an auxiliary bolt, whenever the door is locked; while when unlocked the main bolt is perfectly free and can be moved directly by the key. The parts are so arranged that the key can only be turned in one direction, both for locking and interlocking. By the application of the auxiliary bolt the main bolt is held firm when locked and cannot be moved back by pressing from the outside.

HANGINGS FOR WALLS OF PARLORS AND SALOONS.—J. M. Souternon, New York city.—The object of this improvement is to introduce a new and beautiful covering, or hanging, for the walls of parlors and saloons, by employing for this purpose, instead of wall paper, a delicate tissue, or gauze fabric of silk, the surface of which is watered like moire antique, or ornamented with figures in various colors.

WHIP SOCKET.—E. W. Scott, Wauregan, Conn.—This invention relates to a new and improved fastening applied to a whip socket in such a manner as to hold the whip firmly therein, prevent it from moving or shaking laterally, and at the same time not interfere in the least with its ready insertion in the socket, and its withdrawal therefrom.

WAGON SEAT.—R. N. Rockwell, Glenwood, Iowa.—This invention relates to a novel application of springs to a wagon seat, more especially designed for the seats of lumber and business wagons. The object of the invention is to obtain, by a very simple and economical means, a spring seat which will not, in the application of the springs, interfere in the least with any of the parts of the wagon or the load which may be placed therein.

SNAP HOOK.—C. H. Atwood, New Britain, Conn.—This invention consists in combining a snap hook with a plate in such a manner that the plate will serve as a proteetion to the snap hook, and prevent the latter being injured by abrasion or rubbing, as is more frequently the case, when the device is applied to those bridles for which the invention is more especially designed, as horses are very generally addicted to the habit of rubbing their heads against posts and other fixtures, when attached or hitched thereto. The invention also consists in the mode of manufacturing the invention, whereby a good substantial article is sure to be obtained.

BEVEL AND TRY SQUARE.—John Graham, Ludlow, Vt.—This invention relates to a new and improved combination of a bevel and try square, whereby a very useful implement is obtained for carpenters and joiners.

HORSE YOKE.—Thomas J. Barnes, Cambridge, Ill.—This invention has for its object to simplify the construction of harness, and at the same time furnish an arrangement by the use of which the horses may be worked close up to trees, fences, etc., without injuring the trees, or catching upon the fences.

STOVEPIPE DRUM.—Eben Webster, Holland, Mich.—This invention has for its object to furnish an improved stove drum so constructed and arranged as to obstruct the escape of the heat into the chimney, and cause it to be radiated through the room, which also acts as a damper to regulate the draft of the stove, and which is a complete spark arrester.

ANNUNCIATOR.—Henry Gross and George S. Yingling, Tiffin, Ohio.—This invention is designed to furnish an improved enunciator for use in hotels and other places.

SPINNING WHEEL.—Jonas H. Rowe, Hudson, N. Y.—This invention relates to a new and useful improvement on the simple spinning wheel for household use, and it consists in a novel and useful modification thereof, whereby the operator can spin while sitting perfectly still on a stool or chair by the side of the machine. The object of the invention is to avoid the walking toward and from the spindle hitherto required, in order to draw out or attenuate the roping while being spun, and to cause the yarn as spun to be wound upon the spindle. To this end the invention consists in having the spindle head attached to a radius arm arranged in such a manner that it may be moved through the medium of a treadle, and the spindle made to approach and recede from the operator at the will of the same, due provision being made for the tightening of the belt.

PROPAGATING BED.—N. H. Lindley, Bridgeport, Conn.—This invention relates to a new and improved application of heated water to propagating beds in propagating houses, and has for its object the heating of the bed to a proper or required temperature, and at the same time keeping the temperature of the house sufficiently high to avoid the condensation of vapor, and a consequent damp atmosphere within the house. The great difficulty hitherto experienced in propagating plants by bottom heat has been the keeping of the bed, and the house in which it is placed, at a proper temperature with one and the same heating apparatus—the house, if kept at a proper temperature in cold weather, causing the bed to be unduly heated, and if the latter be kept at a proper temperature, the house being too cold, or of sufficiently low temperature to admit of the vapor condensing, and causing the atmosphere to be damp and unfavorable to the healthy development and growth of the surrounding plants. In order to avoid this difficulty two different heating apparatuses have, in some instances, been used, but this plan is attended with great expense and considerable trouble. This improvement will keep both the propagating bed and the house at a proper temperature with one and the same heating apparatus, which may be very economically constructed.

APPARATUS FOR RAISING AND SECURING THE LEGS OF HORSES TO SHOE THEM.—J. P. Champion, Phelps, N. Y.—The object of this invention is to raise and secure the leg of a horse in order to shoe or otherwise handle him safely with impunity, and it consists of an apparatus formed of straps and levers attached to a frame so arranged that a horse may be kept in position, and have one leg at a time lifted from the ground and held in a bent position securely.

RAILROAD CHAIN.—Peter Allen, Rutland, Vt.—This invention relates to an improvement in the construction of railroad chains, and consists in making two plates of cast iron which form the bed and sides of the chain, and are connected transversely by two screw bolts and nuts, and are secured to the rails and the sill of the track by four spikes, two on each side, passing through both plates, and the flange or base of the rails.

LIFTING JACK.—Jacob Stoody, Ripley, Ohio.—This invention relates to a new and improved method of constructing jacks for lifting purposes, and the invention consists in operating upon an upright lifting bar by an eccentric lever.

SOLAR PRINTING CAMERA.—Lyman D. Bigelow, Albion, Mich.—This invention relates to a new and improved method of moving and guiding the condensing lens of a solar printing camera, whereby it is adjusted so as to correspond with the position of the sun during the day, and during the different seasons of the year.

CEMENT.—John James Bodmer, Newport, Great Britain.—This invention relates to the manufacturer of cements for various purposes, and the combination and use of new materials or substances therefor.

GAGE FOR SEED PLANTER.—H. C. Fairchild, Brooklyn, Pa.—This invention relates to an improvement in the gage of a seed planter, whereby the gage can be set on the hopper from the outside, the seed planter, to which the improvement is attached, being the one for which letters patent were granted in 1860.

WASHING MACHINE.—G. C. Selfridge, Saratoga Springs, N. Y.—This invention relates to a double acting washing machine, the suds box of which has a corrugated bottom and ends and both ends of the plungers being roughened. Thereby the plungers will be enabled to operate on both ends of the washing machine and twice as much work can be done than by the single washing machine.

CAR COUPLING.—Lewis O. Shultz, Mattoon, Ill.—This invention consists in attaching to the drawheads of the car a coupling pin and a guide piece and a hinged catch all of which are made to operate effectively without the aid of springs or weights.

SPRING BOTTOM FOR BEDS, SLATS, ETC.—J. W. Wilder, New York city.—This invention relates to a spring bottom which is appliable to beds, seats of chairs, lounges, sofas or any other article to which a spring bottom may be applied. It consists of a series of springs which are enclosed in tubes and acted on by plungers with large heads on which the cushion, mattress or other article is placed either directly or with intervening slats in such a manner that by the heads the cushion is preserved from being injured by the springs, and furthermore the springs by being enclosed in tubes are prevented from tilting over and consequently they are enabled to retain their power and elasticity for a long time.

METHOD OF ORNAMENTING GLASS LAMP SHADES AND GLOBES.—Richard Guthrie, and John Shearer, New York city.—This invention relates to a new manner of ornamenting plain glass globes or shades for gas or oil lamps, and consists in providing sectional pieces of colored or stained glass, and in fitting the same to wire or other clamps by means of which they can be suspended from the edges of the globe or shade.

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MILK CAN.—Nelson C. Burnap, Argusville, N. Y.—This invention consists in rounding the bottom of the can for the purpose of avoiding the creases which were formed where a flat bottom is used, and in which dirt could easily accumulate but could not so easy be washed out again.

SLEIGH BELLS.—Cyrus R. Clark, Cobalt, Conn.—This invention relates to a sleigh bell to which a shank is cast in the usual manner. To each side of the shaft are secured by means of rivets or otherwise sheet metal plates, which project beyond the lower end of the shank, forming flanges, when inserted in a leather strap, the flanges project beyond the inside of the same, and are then bent out, so as to firmly lock the bell to the strap.

BED BOTTOM.—Frederick Leadbeater, Detroit, Mich.—This invention relates to a new and improved mode of attaching wooden slats to the end pieces of bedsteads whereby a very durable and elastic bed bottom is obtained, and one which may be constructed at a comparatively moderate cost.

BEVEL.—Leonard D. Howard, St. Johnsberg, Vt.—This invention relates to a new and useful improvement in jointed bevels and it consists in having the screw and thumb nut arranged or applied in such a manner that the head of the screw and the thumb nut will secure the blade to the handle or stock, and will be flush with the rules of the latter.

PARASOL AND UMBRELLA RUNNER.—Henry Kursh, Brooklyn, N. Y.—This invention relates to a new manner of arranging the fastening of the sheet metal runners of umbrella or parasol frames, so that the central stick will not be weakened by slots or recesses cut into it as by the ordinary method.

ANIMAL TRAP.—Jeremiah Schroy, Fort Ville, Ind.—This invention consists in an arrangement whereby the animal is forced with a box by a revolving door which is actuated by a spring and which is released by the weight of the animal.

ICE PITCHER.—Nathan Lawrence, Taunton, Mass.—This invention relates to a new and useful improvement in doubled walled or ice pitchers, such as are constructed of white metal and most generally plated. Hitherto these pitchers have had their inner wall or lining constructed with a bottom connected to the body or main portion by means of solder and these bottoms would very frequently become detached or be parted at their joints or seams so as to leak owing to the throwing of large lumps of ice into the pitcher. This invention is designed to obviate this difficulty and to this end I construct the inner wall or lining with a seamless bottom and also strengthen the same by means of ribs or with a "backing" whereby the difficulty above mentioned is avoided.

COMBINED TOOL.—B. W. Collier, Oxford, Miss.—This invention combines in one instrument a pair of pliers, a pair of clippers, a burnisher, a hammer, several punches, three or four wrenches, a saw set, a screw driver, a scraper and a set of holes for straightening wire, nails, etc.

ENGRAVING MACHINE.—John C. Guerrant and Benton J. Field, Leaksville, N. C.—This is an improvement on the engraving machine patented by the same parties Dec. 12, 1866, and numbered 60,506.

GASOLINE COOK STOVE.—Jacob D. Spang, Dayton, Ohio.—This invention consists of a simple device for utilizing and diffusing uniformly the heat from gasoline burners, for the purposes of cooking.

FURNACE.—David Hargar, Des Moines, Iowa.—This invention is for the purpose of conducting air from a pan, or from any cold air region, to a furnace or grate, and distributing it properly to the fire.

MACHINE FOR MAKING PAPER BAGS AND ENVELOPES.—E. B. Olmsted, Washington, D. C.—In this invention the machine is fed from a roll of paper, which it cuts into suitable pieces for bags or envelopes of any desired size and shape, gums, folds, prints, or stamps, and having united the edges firmly, delivers in perfect condition for immediate use.

WAGON BRAKE.—Thomas Smith, California, Mo.—This invention has for its object to furnish an improved manner of attaching the brake block to the brake bar, which shall be cheap, simple, durable and effective.

SELF CLEARING ANCHOR.—W. J. Armstrong and Charles Browne, Brooklyn, N. Y.—This invention has for its object to furnish an improved anchor, strong, durable, and simple in construction, and which shall be so constructed as to clear itself should it become fouled.

COMPOSITION FOR TEMPERING STEEL.—F. G. Harris, Willsborough, N. Y.—This invention has for its object to furnish an improved composition for tempering steel, which will give it a better temper, greater, toughness, elasticity, and hardness without brittleness, than any of the compounds now in use for this purpose.

DEVICE FOR STAMPING AND SHAPING LEATHER.—B. B. Harris, Lockport, Ill.—This invention relates to an improved device for stamping and shaping leather, and consists in a combination of toggle joints, levers, springs, follower, dies, and knife.

GATE LATCH.—Alfred K. Davis, Carey, Ohio.—This invention relates to an improved gate latch, and consists of two bars pivoted on an upright secured to the gate post or upon the gate itself, the bars being attached at one end to another upright or connecting bar, operated by a lever similarly pivoted or attached; or where the latch bars are pivoted to the gate post, then pivoted upon an upright or ear attached at the top of the gate post. The free ends of the latch bars hold the gate by extending over the front vertical bar thereof.

HORSESHOE.—Jacob Wheeler, Huntington, Ind.—This invention relates to an improved form of horseshoe, its object being to expand the hoof when hoof bound or the heel is contracted.

GATE.—S. M. Scothorn, Findley, Ohio.—This invention relates to an improvement in gates, and belongs to that class of double-slide gates in which the extension gate slides in the main gate.

CLEAT CHOCKS.—Amariah Lake, Smith's Landing, N. J.—This invention consists in an improved chock in which the cleat or cairl is bedded. The chock, which may be made of wood or metal (the latter being preferred), is made in the form of a frame having a beveled or grooved edge the ends of which are turned down to clamp the timber or stanchion.

WASHING MACHINE.—Joseph Bevis, Putnam, Ohio.—This invention has for its object to furnish a convenient and effective washing machine, by means of which the clothes may be washed quickly and thoroughly without friction or wear.

PESSARY.—M. J. Rhees, M.D., Mount Holly N. J.—This pessary is to be used as a support and covering to the mouth of the uterus in cases of female weakness, falling of the womb, etc.

COMBINED DOOR FASTENER AND POCKET KNIFE.—Benj. F. Porter, Manchester, N. H.—This invention consists in the combination with an ordinary pocket knife, of a device suitable for use as a fastener for doors.

RAIL JOINT CLAMP.—Francis Pidgeon, Saugerties, N. Y.—This invention consists in the use of a dovetail shaped clamp, thereby dispensing with all bolts and allowing the rail to contract or expand by heat or cold; also in bringing the weight of the train when passing over the joint to and upon the flat bottom to the rail, by carrying the clamp upon the outside of the rail up even with the top of the rail.

TABLE CUTLERY.—Matthew Chapman, Greenfield, Mass.—By this invention the blade, bolster, tong, and handle are all made of or forged from one and the same piece of steel, whereby a most durable, serviceable, and desirable piece of table cutlery is produced.

LAST.—Ambrose Taylor, Osawatomie, Kansas.—The object of the present invention is to provide some simple device as a fastening for the block to the last, whether the last be in use or not and which can be released or unfastened in the most ready and simple manner.

SUPPORTER.—J. B. Seeley, Philadelphia, Pa.—The present invention relates to an abdominal supporter consisting of two front parts, hinged, pivoted, or swiveled to the ends of spring bands, for encircling the hips of the person, the whole supporter being made of hard vulcanized india rubber or gutta percha.

FASTENING FOR THE FLY FRONTS OF PANTALOONS.—Isaac Stratton, Keene, N. H.—This invention consists in a device for fastening the lower part of the fly fronts of men's and boy's pantaloons, instead of employing buttons for the purpose, and is intended especially for the convenience of aged and other infirm persons whose fingers are disabled or crippled, and cannot button and unbutton with facility, and also for boys,

SADDLE.—Godfrey Marshall, Indiana, Pa.—This invention relates to the saddles of harness more particularly, and consists in making the top or frame to the saddle in one piece, having a raised flange or laps around its sides or edges upon its back or under side, and between such laps placing the cushion or pad made of the proper shape and provided with screw nuts, in proper position for receiving the tenet rings, screw sharps and other screw bolts, by means of which the pad is secured to the frame, at the same time also fastening the saddle straps.

HEAD REST.—Robert Hale, Chicago, Ill.—This invention relates to an adjustable head supporter, for use more particularly on railway cars while traveling, the particular object being to provide a supporter of such construction that rest and sleep can be obtained while traveling, while at the same time the supporter is portable, simple, and cheap in construction.

WAGON REACH.—Zenas Plumb, De Witt, Iowa.—This invention relates to an improvement in the construction of a wagon reach, either single or double, and consists in applying a swivel to it in such a manner that the fore and hind axles of a wagon or other vehicle can rock out of the level independently of each other when either wheel falls into a rut or strikes a stone or other obstruction, whereby all twisting or wrenching of the reach is prevented and injury thereof is avoided.

ADJUSTABLE ROTARY LOOM CAM.—Ransom Sargent, Norwich, Vt.—This invention relales to a new and useful rotary cam for making the treddles of a loom to spring the web, and consists of a series of disks or circular trucks attached to a series of shafts which have their bearings in plates or heads secured to a central shaft, the trucks of the sub-shafts set on pins to be movable and adjustable on their shafts in such manner that any one or more may be made to engage with cams of corresponding treadles, for working the treadles and springing the web to suit the pattern of the cloth to be woven.

PIVOT GAGE, STAFF AND FRAME FOR MILLSTONES.—Walter Ring, Gosport, Ind. Patented Oct. 29, 1867.—This invention relates to a device for gaging and stuffing or leveling millstones accurately and plumbing the spindle truly, by which this important part of a miller's work may be performed readily and perfectly by any one, even the most unskillful, with absolute certainty.

SHUTTLE.—George S. Crandal, Pitcher, N. Y. Patented Oct. 29, 1867.—This invention relates to devices attached to and connected with an ordinary weaving shuttle, for the purpose of regulating the filling during the operation of weaving as it runs from the spool to the eye of the shuttle, and also threading the shuttle with greater facility than in the old way.

MODE OF REGULATING A POSITIVE TENSION OF RUBBER THREADS IN ELASTIC FABRIC LOOMS.—F. Painter, East Hampton, Mass. Patented Oct. 29, 1867.—This invention relates to a new and useful improvement in looms for weaving elastic fabrics of vulcanized rubber threads, and consists in an arrangement of mechanical devices for stretching the rubber threads and holding them at a certain positive degree of tension while the fabric is woven.

FASTENING FOR AX AND OTHER HANDLES.—James Stewart, Money Creek, Minn. Patented Oct. 29, 1867.—The object of this invention is to fasten helves or handles in axes, picks, hammers, etc., for the purpose of securing them firmly and permanently in the eye.

FLOUR COOLER AND CONDENSER.—John Gray, Dubuque, Iowa. Patented Oct. 29, 1867.—This invention relates to a new and useful improvement in apparatus for cooling flour and the stones of a mill when grinding, and condensing the moist vapors or steam which are generated in the process of grinding grain.

BLIND HINGE AND FASTENER COMBINED.—Nathaniel B. Spooner, Plymouth, Mass. Patented Oct. 29, 1867.—This invention relates to a new and improved device for hanging window blinds or shutters, by which they are fastened when either opened or closed automatically; it is simple and cheap.

CHILD'S CRADLE.—D. A. Dunham, Palatka, Fla. Patented Oct. 29, 1867.—The design of this invention is to make a cheap and convenient child's cradle of a flour or other light and clean staved barrel, by cutting out a portion of the staves and supporting those which are left to form the cradle with the hoops.

UMBRELLA.—Wm. Money, Paterson, N. J. Patented Oct. 29, 1867.—This invention relates to a new and improved device for holding umbrellas or parasols in place on the handle, whether raised or lowered, and allowing them also to be raised and lowered easily.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

L. C., of Mass.—Cast nails of composition (brass) have been extensively used for boat building and ship building purposes. We have seen them from the size of an ordinary shingle nail up to large spikes. The cast metal is sufficiently tenacious for the purpose.

G. W. F., of Pa.—We know of no better method of razing or trueing a grindstone than cutting circumferential grooves in its face with a file tang and then using a bar of soft iron, as nail rod, to remove the intervening substance.

P. J., of N. Y.—Pen nibs made from the goose quill to be used in a handle, as steel pens, were manufactured in Taunton, Mass., at least twenty years ago. We have some specimens now on hand. They were never very popular.

S. A. M., of Oregon.—According to Bishop's History of American Manufactures, saw mills were used in Massachusetts before they were employed in England. The first mill was erected in the colony in 1633. In England it met with determined opposition, and as late as 1767 one was destroyed by the populace.

Q. A. C., of Ohio.—"Will not a belt slip on a smooth iron pulley sooner than on a rough one? Please give your opinion." Our opinion has been given on this subject before. The general practice of builders and operators of machinery should be a sufficient reply. All pulleys are now made with perfectly smooth faces. The reason is obvious: the larger the surface presented to the belt, of course the greater its adhesion. We remember when for lathe cones nothing but wood was believed to be sufficient, and the faces of the pulleys must be circumferentially scored. Now they are made of iron and polished.

C. G. H., of N. Y.—"How can I prevent stovepipe from rusting while not in constant use?" Heat it and coat it inside and out with paraffine, or with asphaltum dissolved in spirits of turpentine; then keep it in a dry place.

H. V. P., of Ohio, asks how he can mend rubber boots that have cracked. He has tried common rubber, melted, without effect. There is a rubber cement sold almost everywhere which will do the business. Directions accompany each box or can. Pure rubber for the purpose may be dissolved in petroleum benzole. The boots should be perfectly dry and warmed.

R. S., of Ohio wants to know how to get the bright blue which is seen on fire-arms, etc. The process is simply heating the piece to be blued in a clear charcoal fire until the requisite color is obtained, and then covering it with dry ashes. The article to be blued should be highly polished and clean.

J. H. H., of Conn.—Your request that we should write on the incompetency of so-called engineers as one of the reasons for boiler explosions, has already been complied with in several articles. The remedy is beyond our influence. Legislative interference or boiler insurance companies can alone alleviate the evil. We do not propose to harp continually a subject which is already trite.

H. K., of Wis., describes a "hair snake" which he found, and seems to suppose it to be a veritable horse hair. It gave the same sound, when stretched and vibrated, as a hair would under the same circumstances. If he will refer to page 280, in No. 18, current volume, he will find a sufficient reply.

J. M. T., of Minn., thinks a "direct-acting—overshot or breast—wheel, may give better results than any turbine. His plan is to confine the water in the bucket until the pressure of the column from above is cut off and transferred to the succeeding bucket. There will be no chance for back pressure, and after performing their work the buckets are withdrawn so as to be out of the reach of back water until wanted again. This wheel would discharge water only with the motion of the wheel, while others discharge one-fifth or more faster than the motion of the wheel." This appears to be a modification of the automatic bucket wheel. If properly constructed it may be a success.

J. E. R., of N. Y., inquires how to "cut gutta-percha and india-rubber so that it becomes a liquid." Probably our correspondent means by "cutting" dissolving. The solvent for gutta-percha is coal-tar benzole, and for india-rubber benzole of petroleum. India-rubber is "cut" by knives revolving or working in water.

G. H. M., of N. Y., asks "what is the greatest distance to which steam and hand engines have thrown a stream of water." We cannot give a decisive reply, but we have seen a solid stream thrown 220 feet. Makers of fire engines would be better authority.

G. W. M., Ohio.—"Do you know of a cement to stop up stove joints which will harden in time or by heat?" Pipe clay and clean sand equal parts; wood ashes and salt; or iron filings and sal-ammoniac. Either mixed with water will make a proper cement.

A. D., of Pa.—"Can black wool be bleached or dyed white?" No. The only dyeing of white we are aware of is in silk. The pearl white of silk is produced by dyeing; the silk in its natural state being of a pale yellow color and incapable of being bleached.

H. F., of Conn., wishes to convey water from a dam through 400 feet of 20-inch pipe to a flume to supply a turbine, and asks if cement pipe will answer. In reply we would say that we see no reason why the cement pipe will not do, as there is but ten feet of head or fall. It is used for aqueduct purposes with success. A good pipe may be made of pine plank built in the form of a tube and hooped with iron. This is excellent where the diameter exceeds 30 inches. But probably the best form of wooden tube is that patented by J. K. Mayo, composed of spiral veneers. A two-foot tube on this plan ⅝ of an inch thick has successfully resisted a hydraulic pressure of 110 pounds to the square inch.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

A metal-working shop, with two patents, for sale or exchange for Real Estate in city or country. Townsend & Sears, 218 Fulton st., room 7.

Manufacturers of Portable Saw Mills and Engines please send circulars and cash prices immediately. Address J. J. Hovell, Avon, Ill.

For sale low—the patent right of an improved Tag Holder—best out. Address A. Grushus, St. Paul, Minn.

Wanted—a Horizontal Face Plate Boring and Turning Lathe to swing 8 or 9 feet, new or second-hand. Address, with description and price list, T. H. Risdon, Mt. Holly, N. J.

Smith's Brick Machine.—This invention, which was illustrated on page 280 is further described and advertised in another column. See last page of this paper.

J. A. Althouze, New Harmony, Ind., wishes the address of Scissors Manufacturers.

Manufacturers of Loom Shuttles please send their address to Geo. L. Crandal, Pitcher, N. Y.

Wanted—by a thorough practical and licensed Engineer, who is a practical machinist and draftsman, and who uses no intoxicating drinks, a position as chief or assistant, either of a marine or stationary engine. Address Engineer, Adams' Express office, Georgetown, D. C.

A. Leize & Co., Reading, Pa., wish to correspond with Manufacturers of Machines to Saw, Plain, and Joint Barrel Staves.

For Sale Cheap—A Knee-Joint Press, of great Power, for Compressing Bale Cotton, etc. It can be worked by horse or other power, or by hand. Can be seen at Riverdale Mills, Mamaroneck, N. Y. John Mc Donald, Box 8½, Mamaroneck, N. Y.

Makers of Machines for Packing Fine-Cut Tobacco in Paper per and Foil. Send address to Baird & Tuley, 64 East st., Louisville, Ky.

Wanted—The address of the "Diamond Annular Drill Company." Lewis B. Tebbetts, Baltimore.

Wanted—A Manufacturer for my non-conducting illuminated base chimney burner, suitable for Benzine, or any light Petroleum oils, or fluid. Penrose Chapman, Box 145, Brunswick, Me.

Rights for Sale, of Browne's Patent Extension Cabinets for Sewing Machines. J. D. Browne, 177 West Second st., Cincinnato, Ohio.

EXTENSION NOTICES.

George E. Burt, of Harvard, Mass., having petitioned for the extension of a patent granted to him the 7th day of February, 1854, for an improvement in Machines for cleaning and assorting bristles, for seven years from the expiration of said patent, which takes place on the 7th day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 20th day of January next.

William Burnett, of San Francisco, Cal., and John Absterdam, of New York City, having petitioned for the extension of a patent granted to them the 28th day of February, 1854, for an improvement in the use of fusible disks in steam boilers, for seven years from the expiration of said patent, which takes place on the 28th day of February, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 10th day of February next.

James McCarty, of Reading, Pa., having petitioned for the extension of a patent granted to him the 31st day of January, 1854, for an improvement in rollers for scarfing the edges of skelps for lap-welded tubes, for seven years from the expiraton of said patent, which takes place on the 31st day of January, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 13th day of January next.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

2,578.—ANVIL.—James E. Emerson, Trenton, N. J. Sept. 11, 1867.

2,728.—HAT-BLOCKING MACHINE.—Julius Sheldon, New York City. Sept. 27, 1867.

2,739.—RAILWAY WHEEL.—Cornelius Kingsland, McKees Port, Pa. Sept. 28, 1867.

2,742.—MANUFACTURE OF HATS, AND MACHINES FOR PRODUCING THE SAME.—Henry Killogg, New Haven, Conn. Sept, 28, 1867.

2,746.—LUBRICATING PACKING.—Thomas Silver, New York City. Sept. 28, 1867.

2,779.—MACHINERY FOR SEWING BOOTS AND SHOES.—Augustus Destouy and Frederic Renaud, New York City. Oct. 2, 1867.

2,785.—TREATMENT OF COTTON AND OTHER FIBROUS MATERIALS USED IN DENTISTRY.—John A. McClelland, Louisville, Ky. Oct. 3, 1867.

2,799.—MACHINERY FOR THE MANUFACTURE OF BRAID.—George Rehfuss Philadelphia, Pa. Oct. 4, 1847.

2,879.—ELECTRIC TELEGRAPH APPARATUS.—Elisha Gray, Oberlin, Ohio Oct. 12, 1867.

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Improved Portable and Folding Bedstead.

The object of this improvement is to construct a bedstead which may be capable of being folded together and easily transported, stowed away, or removed from the dwelling in case of fire. When ready for use it has the appearance of an ordinary bedstead, as seen in Fig. 1: but when folded for removal, or stowage, it presents the form seen in Fig. 2.

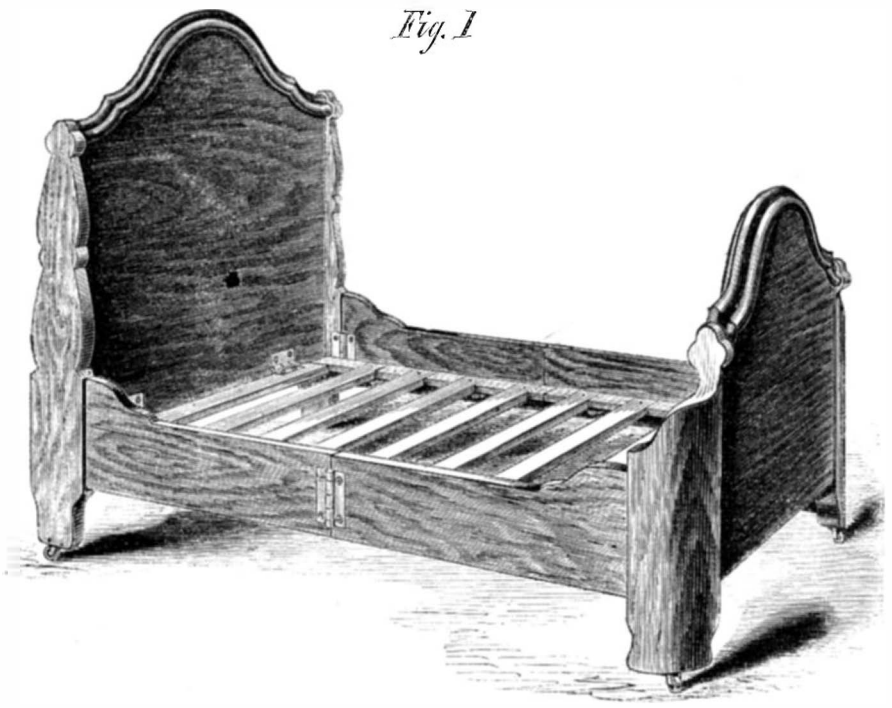
The side rails are made each in two parts, hinged at one end to the head and foot, and at the other together in the middle of the bedstead. The slat frame is also in two parts, one hinged to the head board and the other to the foot board. When in position for the reception of the bedding these frames rest on snugs, or pins, in the side rails. If the bedstead is to be packed or removed these frames are lifted respectively against the head and foot boards, and the side rails swung in, which brings the two ends of the bedstead together, when the whole is secured, as in Fig. 2, by a convenient hook under the head board that engages with a staple under the foot board.

This operation, or that of expanding the device, is the work of an instant, merely, and in either form the bedstead is convenient and easily handled. It can be easily packed on any occasion, whether for removing or transportation. It is complete in itself and obviates the annoyances so often experienced by householders in their frequent removals, the structure being a whole with no loose patch.

One great advantage in a bedstead of this construction is that it has no loose parts liable to be lost or broken, and the whole structure can be removed complete from a burning house in much shorter time than would be required for the ordinary bedstead. Its construction is easily seen by a glance at the engravings

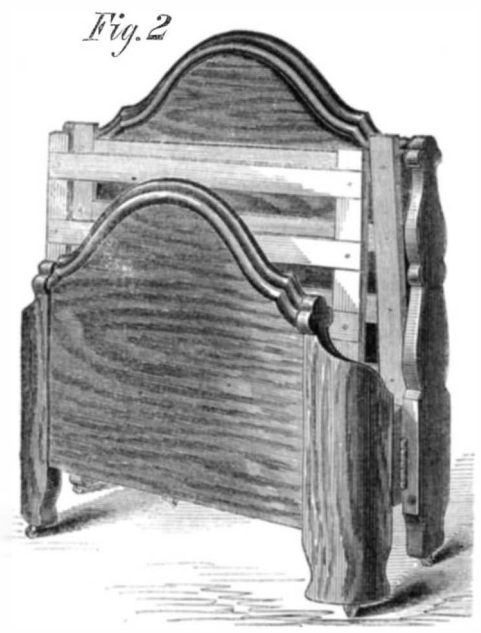
Patented through the Scientific American Patent Agency, Aug. 20, 1867. All communications should be addressed to the inventor, B. F. Woodside, at Atlanta, Ga. States rights are for sale.

Fig. 1



WOODSIDE'S PATENT FOLDING BEDSTEAD.

Fig. 2



The Russian Telegraph.

The complete success of the Atlantic telgraph cables has been the death blow of this enterprise, which was started immediately after the loss of the cable of 1865. The San Francisco *Bulletin* of the 8th ult. gives the particulars of the arrival and experiences of the construction party which for two years and four months have been working on the northwestern coast. Their summers have been passed in a country in which for weeks it never grew dark, and in the winter the daylight does not last more than two hours and a half; in which the thermometer in winter goes down to 58° below zero, and in some places of Russian America to minus 69° F.

The company has explored the route of Russian America, and has located a practical route from the last station in British Columbia to the point where the line would leave the American continent, by a submarine cable, to reappear on the coast of Eastern Siberia, on the Asiatic continent. Since the company's ships left for San Francisco, in the autumn of 1866, seventy-five miles have been constructed in Russian America. In the northern part of British Columbia the work has also been going on within the past year. It has been demonstrated that the northern climate on this continent is not so inclement but what men can work in the winter, and also that extreme cold does not affect the electrical condition of the wire. As regards the northern portion of the continent, the work is now abandoned, all the valuable material and stores and all the constructors having been brought back, and the partially constructed line is left to the mercy of the elements and the good will of the Indians.

It is stated that during the three years the Western Union Telegraph Company have been engaged in this northern region, out of an average number of 250 men in summer and 150 in winter, they have not lost one by accident, by exposure, or by any disease incidental to the country or the work in which they were engaged.

The company had, in 1866, provided sufficient provisions with each party to support them until the vessels returned this year; and except where in traveling a party found unexpected obstacles, or were delayed, there were no cases of serious hardship. Those parties who were near the ports of the Russian Fur Company had the advantage of the Telegraph Company's credit. Those who were in the wilder parts of the country had to depend upon their guns and traps and Indian supplies for any extra delicacies at their tables. Deer and grouse were frequently obtained, and occasionally a little bear meat, and the party in the Upper Yonkton shot several moose. The Indians themselves were worse provided than usual, game and fish having comparatively failed the year before. In one or two Indian villages in the extreme north, the Indians were found reduced to that state of hunger which led them to commence eating their boots. It must be remembered, however, that the Indian stomach is able to derive more nutriment from a piece of old skin than the more delicate digestive organs of a white man would.

WICKERSHAM'S AMERICAN OIL FEEDER.

The advantages of automatic oil feeders over the old fashioned wasteful system of pouring the oil directly from the can into the journal box, are so obvious that none will be found now to question them. The ordinary oil cup has a central tube rising nearly to the top of the cup, the other end reaching the shaft, within which is a wick designed to lead the oil

to the journal by capillary attraction. Much practice is necessary to adjust the size of this wick to the amount of oil it is desired to deliver, which depends on the size and velocity of the shaft journal, weight, etc. If the wick fits too tight or the oil gets too low the supply of the lubricant is diminished, while if the wick is loose or the cup too full the amount delivered is too large. The cups, in fact, act on the principle of gravitation as well as of capillary attraction.

The one shown in the accompanying engraving is intended as an improvement on the ordinary metal cup, and has never yet failed to give perfect satisfaction. The cup itself is made of thick, but transparent glass, with a metallic hinged top for introducing the oil, and a metallic bottom with threaded stem for seating in the cap of the box. A central hollow stem is screwed into the bottom and reaches to the top. The leaders for the oil are syphons of wire, coated like bonnet or hoop skirt wire, and graduated by size and nature of covering to the amount of oil needed on the journal. The short foot of the siphon reaches into the oil, to the bottom of the interior of the cup if desired, and the longer end reaches the surface of the journal. From this description of its parts its operation, by the aid of the engraving, can be readily understood. It may be noticed that the engraving exhibits several siphons in one cup. This is merely to show their different sizes and qualities.

Being made of glass, the condition of the contents of the cup may at all times be seen. It needs filling or replenishing only occasionally—once in three or four weeks, or once in as many months, according to the service required.

The patent dates Oct. 22d, 1867, and the oilers are manufactured by J. B. Wickersham & Son, 143 South Front street, Philadelphia, Pa., who may be addressed for any further information desired.

Mining Economy.

Commissioner J. Ross Browne, in concluding his last report upon the mineral and metallurgical wealth of the Pacific slope, calls attention to the necessity of a more economical working of mines, more saving processes being the desideratum, and not new fields. A thorough knowledge of metallurgy and mining engineering is necessary. To this end the commissioner thinks we should have a national school of mines in the heart of the mining region, conducted on strictly scientific and practical principles, under the control of none but scientific and practical men. The argument he makes on this subject will command attention. He states that the subject of the concentration and parting of ores is now attracting more attention than any thing else in our mineral developments. The immense loss of gold is shown by an estimate based on statistics collected with much care. If we suppose the yield of gold in 1867 to be $70,000,000, the loss would be rated at least 25 or 30 per cent. Better methods of separation and concentration would have made the yield fully $100,000,000. In Montana nearly all the mining is in free gold. Absurd inventions and new-fangled methods, imported from the East, where there is no experience in mining, makes the loss 30 per cent, although it should be much less than in other districts where the gold is more or less associated with other metals. In Idaho, California machinery is generally used, which is the best made. The lodes are worked to better advantage, and the mills do well and keep close to the assays. None of them, however, are yet working sulphurets, except one at Pioneer with results unknown, but probably successful. The loss in that territory is probably 20 to 25 per cent. In Nevada the lodes are mostly silver bearing. At Austin the mills profess to save 80 per cent. In some instances they work up to 90. The loss is probably not more than 15 to 18 per cent. The ores are roasted almost universally. On the Comstock lode the loss is much greater. The Comstock mills do not, probably, save more than 65 to 70 per cent, notwithstanding all the ingenious devices for saving in the tailings. In California there is a large number of excellent mills; and while in many cases the cost of mining and crushing has been reduced to a minimum, the saving is also frequently quite close. Sulphurets are best treated by chlorination, although there are various new processes for which much is claimed. The chlorination process is said to save 90 per cent. It is interesting to notice, in connection with the above, the following statement of the per centage of mining loss in other parts of the world, which is compiled from official documents: St. John del Bey, Brazil, 30; other mines in Brazil, 30 to 35; Piedmont, 35; Hungary and Tyrol, 50; Zell, 35 to 40; Chili, 66: Australia, 40. These figures further illustrate the importance of seeking and adopting the best means to reduce the per centage of loss.

Moisture and Mortality.

Rain, on the whole, would seem to exert a kindly and healthy influence. There is nothing very deadly in it. It may occasion catarrhs and rheumatic complaints, but these are curable with a little management and medicine. And we are apt to put to its credit the washing away of many of the most injurious causes of disease by a good flushing of the sewers. Summer diarrhœa, cholera, and typhoid fever would be likely to be greatly lessened by a copious rain fall. So says the London *Lancet*, and an examination of a meterological and mortality chart for last year shows that in this city the deaths from all diseases were fewest in numbers during times when the number of inches of rain was the greatest. Dr. Trench, the medical officer of health for Liverpool, has satisfied himself by a series of careful observations, extending over a number of years, that there is an inverse ratio between the amount of rain and the amount of mortality from infantile summer diarrhœa. To the same effect are the tables given by Mr. McPherson, illustrating the relations of moisture to the mortality of cholera in Calcutta. According to these tables, the least mortality from cholera in Calcutta occurs in the months of July, August, and September, which are emphatically the wet months.

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PECULIARITIES OF MACHINES---THEIR INDIVIDUALITY.

An article cut from an exchange has revived in our mind some recollections which may have a practical bearing. Years ago we had some personal experience as a builder and manager of steam engines, both stationary and locomotive, and we had noticed the peculiarities of machines, which, according to the rules of mechanical skill and the exactness of human endeavor, should be alike, yet which presented such marked points of difference, if not of divergence, that mechanical talent was entirely at fault to account for the variation.

Every experienced engineer—to take steam engines as a sample—has noticed frequently, or repeatedly, that while one engine developed its full amount of power, or that quota which was expected of it, another, built after the same patterns, with the same tools, and by the same workmen, failed to fulfill the design of the constructor.

Sometimes it is difficult, if not impossible, to account for these differences, but it is noticeable that they are the more marked as the machinery is the more complex, so that it is natural to suppose that there is, somewhere in the details, a difference of construction, otherwise we must impute the variation to some mysterious agency whose operations are irremediable by mechanical skill. But even when the machine or implement is simple in its parts and built after unvarying gages, the differences may occasionally be detected. The little pocket pistol which may be one of thousands built by the same machinery and workmen will, in some cases, differ widely in its execution from others of the same lot, when a careful comparsion fails to detect the reason. That there must be some variation either in quality of material or construction the mechanic is assured, but he may not be able to ascertain what it is. Sometimes, however, the cause of difference may be detected. A case in point, which we remember, was that of two locomotives running on the same road, the machines being so nearly alike that their parts were interchangeable, yet which differed widely in their respective performances. Repeated examinations of the working parts failed to reveal the cause. The engineer of the inferior machine spent many hours in "tinkering" and "coaxing" his engine, yet still it refused to perform the work of its mate. As a last resort he measured the apertures of the exhaust pipes on both engines, and found that while those of the rival machine measured one-and-a-quarter inches, his measured one-and-three-eights inches. The pipes being of copper, he "drew in" those of his engine one-eighth of an inch, when it performed even better than the other, owing, undoubtedly, to the better care which had been taken of it and its more perfect condition. The difference in the diameter of these pipes was but a trifle, yet no doubt it was the reason of the variation in the work of the two locomotives.

So it may be often that a slight change in the proportions or the actual dimensions of parts may insure evenness and accuracy where the divergence and uncertainty may have been remarkable and mysterious. To ascertain and remedy these points of difference is the province of the intelligent, practical, and educated mechanic. Exactness and accuracy in tools—of which we spoke in a recent number—and educated skill are the true remedies for these difficulties. There is nothing about these differences which need be mysterious or undiscoverable.

But there are some curiosities about machines which seem to be unaccountable. Every user of a sewing machine knows that from some unknown reason the machine which yesterday performed its work so well, so almost enthusiastically, to-day refuses to do more than half its task, and does that half in a surly, indifferent manner. So with many other machines. Even the steam engine is subject to these fits. Is there some occult bond of sympathy between the operator and his machine, by which the latter is influenced by the mental condition of the former; for it is certain that these differences cannot always be attributed to atmospheric or other external influences? This matter is quite humorously and truthfully treated in the subjoined extract, to which we referred in the beginning of this article:—

"It is perfectly well known to experienced, practical engineers, that if a dozen different locomotive engines were made at the same time, of the same power, for the same purpose, of like materials, in the same factory, each of those locomotive engines would come out with its own peculiar whims and ways, only ascertainable by experience. One engine will take a great meal of coal and water at once; another will not hear to such a thing, but will insist on being coaxed by spadesfull and bucketsfull. One is disposed to start off, when required, at the top of his speed; another must have a little time to warm at his work and to get well into it. These peculiarities are so accurately mastered by skillful drivers, that only particular men can persuade particular engines to do their best. It would seem as if some of these 'excellent monsters' declared on being brought out of the stable, 'If it's Smith who is to drive me, I won't go. If it's my friend Stokes, I am agreeable to anything!'

"All locomotive engines are low spirited in damp and foggy weather. They have a great satisfaction in their work when the air is crisp and frosty. At such a time they are very cheerful and brisk, but they strongly object to haze and mists. These are points of character on which they are all united. It is in their peculiarities and varieties of character that they are most remarkable.

"The railway company who should consign all their locomotives to one uniform standard of treatment without any allowance for varying shades of character and opinion, would soon fall as much behindhand in the world as those greater governments are, and ever will be, who pursue the same course with the finer piece of work called Man."

BOILER FURNACE GRATES---THEY SHOULD BE SUITED TO THE COAL.

It has been found by long experience with coal-burning locomotives that furnace grates that will give very satisfactory results with one kind of coal, will give results with another kind (which although it may not show on analysis any material difference in the quantity of its combustible elements or indeed in the quantity of the ash) not at all satisfactory. This is due, for the most part, to the different nature of the substances which constitute the ash left from the combustion of the two species of coal.

If there is a great deal of silicious matter in the ash, which the high temperature in the locomotive furnace can partially fuse, it will run together and a hard vitreous clinker will be the result; and as in a locomotive furnace, owing to the power of the artificial draft produced by the rapid puffs of the exhaust steam, an immense quantity of coal is burned on a very small grate, it will not require a very rapid formation of vitreous clinker to cover the grate (if no means are provided to clean it) to impede the draft and reduce the steam so that the engine can no longer "make time." If, on the other hand, the ash is of a lighter nature, instead of fusing on the grate bars and making clinker, it will be carried through the tubes of the boiler, by the fierce draft, and peppered over the train and the passengers. It is obvious, therefore, that a grate which in the one case will burn the coal perfectly well, will in the other, cause the engineer to be disgusted at the inadequate supply of steam and complain loudly to his superiors of the inferior quality of the coals. With the coal which forms the sort of ash which the draft does not haul through the tubes and scatter over the train, a grate will be required sufficiently coarse for all the clinker to fall through it, and also provided with a suitable "rocking" arrangement to shake the ashes out. If by thus making the grate coarse enough to allow the ashes to pass through, the air spaces through it are too large for the proper and economical supply of air which is necessary to burn that portion of the coal which is consumed on the grate bars themselves—viz., the carbonaceous portion—the supply can be readily governed to the proper amount by simply partially closing the ash box doors.

For freight trains it may not be important which sort of coal is used—that is, the kind which keeps its ashes in the fire box, or the kind which sends them through the tubes and out of the pipe. But the case is quite different with passenger trains, for in one case only one or two brakemen are incommoded by flying soot and cinders; in the other, however, the passengers are peppered and begrimed by black dirt rendered sticky by contact with the exhaust steam mixed with the grease from the cylinders.

It will, we think, be admitted that by a proper construction of the grates, a railroad which has at command two species of coal possessing the characteristics alluded to, can add greatly to the comfort of the passengers by using the sort which keeps the greatest portion of its dirt within the firebox and at the same time maintain an evaporative power in the boilers equal to that produced by the other. When we come to coals which have different proportions of combustible elements, still greater attention must be given to the distribution of the air required for combination in order to insure the perfectness of the combustion.

Thus the greater the proportion of volatile combustible matter, the less must be the quantity of air admitted through the grate bars and the greater the quantity which must be admitted, distributed, and mixed with the combustible gases above the fire. This is clear, for the reason that the hydrogeneous portions of a coal must be burned above the fire, or else not be burned at all and pass unconsumed into the atmosphere and this, as is now well understood, can only be accomplished by introducing a sufficient quantity of air, which, when mixed with the combustible gases, will combine with them to the point of saturation and thus attain the highest temperature possible under the conditions; the carbon, on the other hand, is burned on the grate bars themselves and consequently the air for its combustion must pass through the spaces between them, and the supply of air should be governed to the proper amount by the dampers before alluded to.

From our own observations we are pretty well convinced that if the master mechanics on our railroads understood a little more about the principles of combustion and the chemical characteristics of the coals they are called upon to burn that not only would there be less complaint from passengers on account of the smut from the locomotives, but that there would be considerably less growling from the engineers about bad coal and "could'nt make steam."

IMPROVED CONDITION OF THE PATENT OFFICE.

We observe a marked improvement in the condition of the Patent Office. The Commissioner has increased the examining force very materially, both by new appointments and by promoting Assistants to be primal Examiners. Many of the classes most in arrears have been divided, additional space has been attained, and every department of the Office indicates progress and improvement. The machinery is not yet so perfect in its running as we expect to see it, but the motive power and room are supplied, and when the men occupying their new positions get better accustomed to their duties we bespeak for the Office an administration of its details worthy its patronage.

The Commissioner has latterly exhibited a commendable degree of enterprise in reorganizing the Office, obtaining additional room and appointing new Examiners, and we are assured that it will not be long before the back work of the Office will be brought up. As an evidence of the activity of the examining force of the Office, we would refer to the long list of patents reported weekly in these columns.

Mechanical Music.

A musician of this city has contrived an apparatus which he calls a "Pianautomaton," and which is designed, as its name implies, for automatically playing upon a pianoforte any piece of music desired. The instrument is described, externally, as a box of the width and length of the keyboard to which it is clamped. Through a slot runs the piece of music which is to be played, and which has this peculiarity, that all the notes are perforated through the sheet. The box has a crank which sets in motion a magneto-electric apparatus, and by its means a series of axial bars protuding below the box, strike the pianoforte keys and correctly perform the musical composition indicated by the holes in the paper. This contrivance rather belies its name in that music is ground out, as in the better known street instrument of humbler pretensions; but in another form, the apparatus is entirely self-acting, the insertion of the perforated paper causa small lever to come in metallic contact, thus completing an electric current, the instrument then continuing to play until all the music paper has passed through the aperture, when the lever being no longer held up, the circuit is broken and the performance terminated.

The axial bars strike the key notes with four different degrees of strength, either with a *legato* or *staccato* touch, and with a suitable connection with the pedals, all degrees of musical expression are attainable. It is apparent that this instrument can be made to produce effects of execution which no living artists could think of attempting. For example, a chromatic scale in octaves, thirds, or tenths; or produce the effect as if four, six, eight, or more hands were performing. There is no hesitancy in "reading at sight," and the variety of pieces need not be a limited *repertoire*, like a hand organ.

An Absolutely True Water Wheel Thirty-one Feet in Diameter.

Mr. S. F. Gold, of Cornwall, Conn., an amateur millwright, has built and put in operation a water wheel thirty-one feet in diameter, which he claims runs absolutely true, and can be kept in motion by the water through a two inch pipe.

If the wheel is of wood, and when dry runs true, and also runs true when wet and soaked, the wheel must be pretty nearly perfect. The head of the water delivered through a two-inch pipe is an element to be considered. However, the wheel is an achievement to be proud of, when it is considered that the maker is not a practical millwright.

AMERICAN MADE TOYS.—A correspondent, alluding to an article on the above subject, in a recent number of the SCIENTIFIC AMERICAN, says that "at Cromwell, Conn., is a large factory where all kinds of cast iron toys are made. At Bristol, same state, doll heads are made of untanned leather, which cannot be easily broken or injured. Large mechanical toys, as velocipedes, imitation steam engines, steamboats, fire-engines, etc., are made in Forestville, Conn., the only place in the United States where such toys are manufactured." Toys are also largely manufactured in Hartford, Conn.

WE have received from Messrs. Babbit Brothers some samples of their patent penholders which we find to be excellent The pen is held between springs so as to give elasticity. The holder is marked with the French and English measures of length

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OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING NOVEMBER 5, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
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On application for Extension of Patent.....$50
On granting the Extension.....$50
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On filing application for Design (seven years).....$15
On filing application for Design (fourteen years).....$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

70,384.—RAILROAD FREIGHT CAR.—J. H. Aldrich, Nashua, New Hampshire.

I claim the cattle-car, when substantially arranged as and for the purpose described.

70,385.—TOBACCO-SMOKING TUBE. — James M. Alexander, Delhi, Ohio.

I claim a tobacco-smoking tube, formed by combining an outer tube with an inner wire gauze, perforated or porous cylinder, in either of the forms above described, so that the smoke will be drawn to the mouth without passing through the tobacco, substantially as set forth.

70,386.—MODE OF TREATING TOBACCO. — Gustavus Arnd, New York city.

I claim, 1st, Treating tobacco with acids, such as acetic acid, formic acid, malic acid, lactic acid, or any other acid of a similar nature, substantially as and for the purpose described.

2d, Treating tobacco with vegetable substances, such as saccharine or other juices, and then subjecting the same to fermentation, substantially as and as and for the purposes set forth.

70,387.—ELEVATOR.—Edw'd H. Ashcroft, Lynn, Mass.

I claim the combination of the frame, H, with its friction rollers, h and g, and the screw, E, constructed and operating in the manner substantially as shown and described, and for the purpose set forth.

70,388.—METHOD OF COVERING STEAM GENERATORS.—E. H. Ashcroft, Lynn, Mass.

I claim, 1st, The combination and arrangement of bands, A, hooks or points a, and cement layer, B, substantially as shown and described, and for the purpose set forth.

2d, The combination and arrangement of covering, F, alternate layers, E D C B, and bands, A, constructed and operating in the manner substantially as shown and described, and for the purpose set forth.

70,389.—CONDENSER.—E. H. Ashcroft, Lynn, Mass.

I claim the combination and arrangement of the waste pipe, A, showering pans, B, reservoir, E, and supply pipe, C, operating in the manner substantially as shown and described, and for the purpose set forth.

70,390.—FIRE-PROOF SAFE.—E. H. Ashcroft, Lynn, Mass.

I claim, 1, In a fire-proof safe, a series of perforated water pipes, E, or their equivalents, arranged substantially as described and for the purpose set forth.

2d, In combination with said pipes, the inner perforated lining, B, and chamber, D, arranged and operating in the manner substantially as shown and described and for the purpose set forth.

3d, In combination of the chamber, D, and water pipes, F, constructed and operating in the manner substantially as shown and described, and for the purpose set forth.

4th, The tappet rod, e, bolt, d, and tooth, a, in combination with the projections, e', slide, C, and feed screw, D, substantially as and for the purpose set forth.

5th, The stop, f, in combination with the tooth, a, slide, C, feed screw, D, and case, A, constructed and operating substantially as and for the purpose described.

6th, The trap, H, in combination with the feeding and separating mechanism, constructed and operating substantially as and for the purpose set forth.

7th, The folding flap, K, hinged T-shaped brace, M, and hinged head, L, in combination with the eye-glasses, J, and case, A, constructed and operating substantially as and for the purpose described.

8th, The oscillating finger, N, in combination with the trap, H, and with the feeding and separating mechanism, constructed and operating substantially as and for the purpose set forth.

9th, The lower slide, O, in combination with the folding and separating mechanism, constructed and operating substantially as and for the purpose described.

10th, The method, herein described, of collecting the pictures in the lower part of the case, after they have been viewed, so that they can be removed in quantities or packs, as set forth.

11th, Giving to the lower slide, O, a faster motion than to the feed slide, C, substantially as and for the purpose described.

12th, The winding mechanism, Q, in combination with the slides, O C, and cords, s' t, constructed and operating substantially as and for the purpose set forth.

70,392.—LAMP EXTINGUISHER.—Wm. P. Bennett (assignor to himself and Henry Blake), East Pepperell, Mass.

I claim the application of the two rollers, a a, to the wick tube of the burner, so that the said rollers may operate with and be operated by the wick, substantially in manner and for the purpose set forth.

I also claim the combination and arrangement of the slotted arms, b b, with the two rollers, a a, and the wick tube, or with an additional tube or collar, f, applied to such wick tube, as specified.

I also claim the combination, as well as the arrangement, of the stops or guards, h h, with the rollers, a a, and the wick tube, applied and arranged together substantially as explained.

70,393.—EMERY WHEELS FOR GRINDING AND POLISHING SAWS, &c. George L. Benton (assignor to himself and John Greenwood), Rochester, N. Y.

I claim the emery wheel formed with the narrow grinding rim, a, and central depression, b, and made of the conical or convex shape herein described, the same operating in the manner and for the purpose specified.

70,394.—DEVICE FOR HOLDING SAP-BUCKETS.—Julius Bevins, Unadilla Forks, N. Y.

I claim the bar, A, the hook, B, and the curved hook, C, when they are arranged in the manner specified.

70,395.—GAS STOVES.—John K. Birkey, Philadelphia, Pa.

I claim, 1st, The tube, B, arranged in respect to the hollow cone, D, and wire gauze, or perforated disk, E, substantially as and for the purpose set forth.

2d, The plate, F, with its inclined inner edge arranged in respect to the perforated plate, of wire-gauze disk, E, substantially as and for the purpose described.

70,396.—CORN-SHELLER.—Thomas W. Bishop, Austin, Ind.

I claim, 1 t, The combination with the shelling device, E E, of the gear wheels, C and D, hub, D1, and central opening, D2, substantially as and for the purpose set forth.

2d, The serrated opening, G, substantially as and for the purpose described.

70,397.—SKELPING-DIES.—Mildred Blakey, Pittsburg, Pa.

I claim the construction and use of the skelping-dies, made either solid or separate, with a slot, or opening, b, extending longitudinally along their upper part, through or between them, substantially as and for the purpose hereinbefore set forth.

70,398.—GAS-CHANDELIER ATTACHMENT.—Alfred Bliss, New York city.

I claim the combination of a wheel, or reservoir, supplied with gas in any convenient manner, with a flexible tube, for the purpose indicated.

70,399.—RAILS FOR RAILWAYS.—Jonathan L. Booth, Rochester, N. Y.

I claim the combination of the body, A, nicked and indented as described, with the cap, B, substantially in the manner and for the purpose herein set forth.

70,400.—RAILS FOR RAILWAYS.—Jonathan L. Booth, Rochester, N. Y.

I claim the cap, B, in combination with a base, A, having a longitudinal depression in its upper surface, substantially as and for the purpose specified.

70,401.—STOCK AND POULTRY-FEEDER.—George Bowerman, Napoleon, Ohio.

I claim the bin or reservoir, C, valve, E, in combination with the rod, F, lever, G, and case, A, constructed and arranged as and for the purpose set forth.

70,402.—SPINNING-JACKS.—Henry P. Briggs, Clarksburg, Mass.

I claim, 1st, The lever, G, having a cam, F, at a suitable point thereon, for acting against the belt shipper, substantially as described.

2d, The adjustable standard, N, and lever, M, in combination and arranged to operate with the carriage of a spinning-jack, substantially as described.

3d, The combination of the adjustable standard, N, lever, M, lever, G, and connecting-rod, I, or an equivalent connecting device, substantially as described.

4th, The levers, M and G, applied to the shipper, D, or the driving shaft of a jack for the purpose of bringing the fast pulley, C, into partial engagement with the race-shaft belt, substantially as and for the purpose above set forth.

70,403.—CLEANER FOR LAMP-CHIMNEYS.—Obidah B. Brown, Malden, Mass.

I claim a lamp-chimney cleaner, consisting of an elastic cylinder, or tube, attached to a handle, substantially in the manner described.

70,404.—STRAW-CUTTER.—Addison Buch, West Earl Township, Pa.

I claim the construction and arrangement of the metallic plate, A, and spring board, B, in combination with the bottom plate, C, and arrangement of the knife, D, and lever, H, in the manner and for the purpose specified.

70,405.—ILLUMINATING OILS.—Asa W. Burrows, Cleveland, Ohio.

I claim the above described compound, composed of the ingredients herein given, in the manner as and for the purpose set forth.

70,406.—CHURNS.—Philander Byrns and George Stannard, Mindora, Wis.

We claim the churn, B, perforated board, F, handles, E E, chair, A, and connecting rods, C C, when all are constructed, arranged and operated as and for the purpose set forth.

70,407.—STEAM ENGINE.—Charles W. Cahoon, Portland, Me.

I claim, 1st, A carriage, having a receptacle containing hot water under pressure, when the water has been heated at a place other than in or on the carriage, substantially as and for the purpose described.

2d, Also the combination of a carriage, receptacle, and engine, substantially as and for the purpose described.

3d, Also the combination of a non-conducting material with the receptacle upon the carriage, containing water heated and transferred as described, substantially as set forth.

4th, Also a reserve tank, containing water heated and transferred as described, for the purpose and substantially as set forth.

70,408.—BENT KNEE AND FRAME FOR SLEIGHS.—Daniel O. Card, Rawsonville, Ohio.

I claim the herein-described bent knee and beam, as a new article of manufacture.

70,409.—REGISTER PADLOCK.—J. L. Chambers, B'klyn, N. Y.

I claim, 1st, Constructing a lock with two independent bolts, which are so arranged as to act together, simultaneously locking both the hasp and bottom plate of the lock, said bolts being operated by a series of tumblers, which are worked by means of a flat key, substantially as described.

2d, Securely locking the tablet in position by means of the bottom plate, I, substantially as described.

70,410.—TELEGRAPH CLOCK.—Js. Chandler, Syracuse, N. Y.

I claim the application of cords and wires to the clock and weight, as herein described, for the purpose of indicating the time and striking the hour at various points.

70,411.—ELASTIC SASH ELEVATOR.—S. A. Chase, Boston, Mass.

I claim the mode of elevating window-sashes by means of elastic cords, substantially in manner and for the purpose as described.

70,412.—HOISTING APPARATUS.—Henry Chatfield, Wolcottville, Conn.

I claim, in combination with a hoisting machine, the toggle-arms, I I, arranged and operating in connection with the belt-shipper, H, brake lever F, and brake, G, substantially as and for the purpose herein specified.

70,413.—TONGS.—Samuel Collinson, Buffalo, N. Y.

I claim constructing tongs, with two or more tongues, b c, for grasping several articles at the same time, arranged and operating substantially in the manner set forth.

70,414.—LINING BARRELS WITH SHEET METAL.—Theodore R. Cook, Saratoga Springs, N. Y., assignor to Henry Lawrence, Norristown, Pa.

I claim rubbing out or burnishing down the metal lining against the wood of the barrel to make the metal lining fit the inside of the barrel closely, substantially as described.

I claim as a new article of manufacture a wooden barrel, lined with sheet-metal, which is made to fit the wood closely on the inside by being rubbed or burnished against it.

70,415.—FIRE-PROOF SAFE.—Thomas Cook, London, Eng., assignor to Chas. P. Button, New York City.

I claim the construction and application of a screw-fitting door to safes and depositories, substantially as above described.

I claim also the hinged arm, H, and the screwed axis G, for supporting the weight of the door, C, and guiding the same in a true horizontal plane during the opening and closing of the said door, as above described.

70,416.—DIFFERENTIAL WHEEL GEARING.—Chas. F. Cooke, York, and John Stanfield, Lambeth, Great Britain.

We claim, 1st, The novel combination and arrangement of differential wheel gearing, and its application to various purposes, in the manner substantially as described.

2d, The combination of our said differential wheel gear with parts for the purpose of forming crabs and other hoisting apparatus into self-acting weighing machines, in the manner substantially as described.

70,417.—MANUFACTURE OF BUTTER.—Joseph Sigler, Anderson, Ind., administrator of the estate of Jesse P. Crampton, deceased.

I claim the method herein described of improving common butter by churning it over, in combination with new or sweet milk, white sugar, nitrate of potash, and liquid rennet, or their equivalents, substantially in the manner and in the proportions herein set forth.

70,418.—VERTERINARY NARCOTIC INJECTOR.—Moritz Crohn (assignor to himself, H. W. Volkers, and Guido D'Oench), St. Louis, Mo.

I claim the combination and arrangement of the bowl, A, the tube, B B', and the bellows, C c, substantially as and for the purpose set forth.

70,419.—FLOATING WATER POWER.—Commodore Daniels, Fremont, Ohio.

I claim, 1st, The sliding frame, G, in combination with boats, D, and wheels F, the whole constructed and operating as herein described.

2d, The sliding frame, G, in combination with boats, D, wheels, F, apron, N, anchor piece, g, the whole constructed and operating as and for the purpose substantially as herein set forth.

70,420.—CURING TOBACCO.—Benj. A. Davis Petersburg, Va.

I claim, 1st, The openings, with their covers, close under the roof, both front and rear, for the purpose of admitting air, ventilating and carrying off the evaporation from tobacco while in the process of curing, as herein described.

2d, The process of drying or curing tobacco under a glass roof, substantially in the manner herein described.

70,421.—COMPOSITION FOR PACKING JOURNAL BOXES, JOINTS, ETC—John T. Davis, Jersey City, N. J., and Wm. C. Selden, Brooklyn, N. Y.

We claim, 1st, A composition of paper pulp, soapstone, and sulphate of zinc, or its equivalent, substantially as and for the purposes specified.

2d, A composition of paper pulp and sulphate of zinc, substantially as and for the purposes set forth.

70,422.—FASTENING FOR COACH LAMPS.—Marcus De Voursney, Newark, N. J.

I claim, 1st, A bracket, A, provided with arms, a, and a socket, b, in combination with the standard, B, and with a coach lamp, substantially as and for the purpose described.

2d, Fastening the socket to the back of the lamp by means of the arms, a, substantially as and for the purpose set forth.

70,423.—DEVICE FOR SETTING SAW TEETH.—Henry Disston, Philadelphia, Pa.

I claim the notched swage, F, in combination with adjustable rods, G and G', the lower ends of which are adapted to or arranged to embrace the collar and washer or the spindle of a circular saw, all substantially as and for the purpose herein set forth.

70,424.—DEVICE FOR SHARPENING SAW TEETH.—Henry Disston, Philadelphia, Pa.

I claim, 1st, The combination of a file or cutter, A, and a cross bar or guide, F, arranged in respect to the cutter as to determine the extent to which the latter shall penetrate the front of the saw tooth, all substantially as described.

2d, The combination of the above and a bar, G, or its equivalent, so arranged as to determine the extent to which the cutter shall penetrate the saw blade.

3d, The mode, substantially as described, of rendering the bar, F, adjustable to and from the file, A.

70,425.—SADDLE TREE.—D. A. Dixon, St. Louis, Mo.

I claim, 1st, The combination and arrangement of the loop, a', with the pommel, A.

2d, The construction of the cantle, C, substantially as described and set forth.

70,426.—OZONE GENERATOR.—Wm. Elmer and H. G. Hubert, New York City.

We claim, 1st, The combination and arrangement of the vessel, A, with the porous cup, B, the one filled with the granulated porous substance, W, and the other partly filled with the liquid chemical re-agent, Z, in the manner substantially and for the purpose set forth.

2d, The combination of the rod, E, cement stopper, e, and cap, T, with the vial, D, and cup, B, arranged so as to operate substantially in the manner specified.

3d, The granulated porous substance, W, and the liquid chemical, Z, in combination with a porous cup, B, so that the reaction between the said chemical, Z, and substance, W, will take place as set forth and for the purpose specified of producing ozone.

70,427.—CONSTRUCTION OF SHEET METAL BUCKETS.—James Fallows (assignor to Porter & Booth), Philadelphia, Pa.

I claim producing the flared or flanged base of a sheet metal vessel requiring such a base, by corrugating the sheet metal of the body of the vessel, substantially as described and set forth.

70,428.—SHUTTER-BOWING BOLT.—Walter H. Fitzgerald (assignor to himself and W. H. Sexton), Philadelphia, Pa.

I claim, 1st, In combination with a shutter bolt, the small friction bolt, d, on the plate, C, and the notches, 3-3, in the bolt bar, c'', the same being arranged to operate together as a stop or lock for the bolt bar, substantially as set forth and described.

2d, Also in combination with the subject matter of the preceding clause of the claim, the small friction bolt, f, and the recess, e, in the plate, C, and the vertical hole in the forward end of the bolt bar, c'', the same being arranged to operate together substantially as and for the purpose set forth and described.

70,429.—CATTLE-GUARD GATE.—Armstrong Freeman, Lowell, Mich.

I claim, 1st, The side rail, H, lever, I, chains, L, and levers, K, as arranged, in combination with the gate, A, for the purpose and in the manner as set forth.

2d, The gate, A, and roller, D, as, arranged, in combination with the standard, M', links, N, and weighted arm, N', in the manner and for the purpose herein described.

70,430.—CULTIVATOR.—Hugh J. Graham, Monmouth, Ill.

I claim, 1st, The slotted bar, C, in combination with the handles, F F, and upright bars, P P, substantially as described and for the purpose set forth.

2d, The curved iron, T, in combination with the notched bar, V, clutch, W, brace, Q, and sliding seat, D, arranged as set forth and for the purpose claimed.

3d, The movable bar, N, in combination with the handles, for the purpose described and substantially as arranged.

4th, The clutch or slide, W, and notched bar, V, substantially as described, and combined for the purpose set forth.

5th, The hinge, C, in combination with the curve, T, for the purpose of giving vertical and lateral movement, and for vertical adjustment.

70,431.—CHURN.—Jas. J. Gruver and Ambrose D. Wiggins, New Market, Ohio.

We claim the slotted bed piece, E, churn, F, when provided with tennon, h, and adjustable guide board, m, all arranged in connection with dasher bars, b b, pitmen, e e, and double crank shaft, d, as and for the purpose set forth.

70,432.—GAS COOKING RANGE.—David G. Haskins, Cambridge, Mass.

I claim, 1st, The combination of the base, A, and combustion chambers, a b, with the ovens or cooking apartments, B C, and the interposed inclined flue space, s, as and for the purpose specified.

2d, The combination of the base, A, and combustion chambers a b, the ovens or apartments, E C, and the reservoir, D, as and for the purpose specified.

3d, In combination with a gas cooking range constructed substantially as described, a water back, E, as set forth.

70,433.—LIGHTING ROOMS.—David G. Haskins and Joseph Winlock, Cambridge, Mass.

We claim the combination of a lamp, a, provided with an air passage as described, the screw, c, and air pipe, d, in combination with an air-propelling apparatus, as and for the purpose set forth.

70,434.—HARNESS.—Nathan T. Healy, Medina, N. Y.

I claim forming the hip straps E, without intermediate buckles and passing said straps loosely through the bearing, C, and providing a suitable adjustment of the same on the back strap, as herein set forth.

70,435.—PREPARING FISH FOR FOOD.—George H. Heron (assignor to himself and Samuel E. Day), Washington, D. C.

I claim preparing fish for food by the application of heat and a suitable acid, substantially as described.

70,436.—BEEHIVE.—Jesse Hiestand, Palestine, Ill.

I claim the construction of the body or lower portion of the hive of three vertical boards, A A A', and one inclined or sloping board, terminating at the bottom in a narrow entrance, a, at the top in a honey chamber, E, said hive being supported upon a frame, G, which is provided with protectors, g, substantially as described.

70,437.—PREVENTING TIN WARE FROM RUSTING.—Portus M. Hinman, Rochester, N. Y.

I claim the herein described method of protecting common articles of tin ware from rusting, by providing them with a zinc bottom or rim, substantially in the manner set forth.

70,438.—SECURING THE ENDS OF FELLEYS.—Hiram Inman and Horace Inman, Amsterdam, N. Y.

We claim the device for securing the ends of fellys constructed substantially as described.

70,439.—APPARATUS FOR MAKING EXTRACTS FROM BARK AND OTHER MATERIALS.—James W. Jones, Cumberland, Md.

I claim, 1st, Extracting the strength from bark or other material by upward hydraulic pressure, when the same is applied to a vessel having a box pipe with sliding valves and a false perforated bottom, substantially as described.

2d, The false bottom, C, and pipe, D, having sliding valves, d2 d3, when the same are combined and operated substantially as described and for the purpose set forth.

70,440.—BOOT CRIMP.—Franz Kali and Samuel Andrews, Rochester, N. Y.

We claim the heel block, D, for varying the position of the seam of the boot, and the metal lined sockets, c c', beneath the blocks, B C, of the crimp, for the insertion and adjustment of the screws, the whole arranged and operating as herein set forth.

70,441.—TABLE URN.—Ernest Kaufmann, Philadelphia, Pa.

I claim, 1st, A table urn which can be revolved on its stand, and is provided with two or more compartments or chambers, c, and faucets, E, substantially as and for the purpose set forth.

2d, The arrangement and combination of an urn, A, with two or more compartments, c, annular lip, a, stand, B, ears, b, lamp, D, and faucets, E, all constructed and operating substantially as and for the purpose shown and described.

70,442.—PICTURE ENVELOPE.—C. A. Kihlgren, Boston, Mass.

I claim the improved picture envelope made substantially as described, that is, with its flap folded, and of a length so as to be capable of being laid over both faces of the pocket, the same being as and for the object or purposes as hereinbefore explained.

70,443.—PUMP.—John T. Kimbel, Vernon, Ind.

I claim the combination and arrangement of the two solid pistons, H H, and the cylinders in which they work, with the ways and valves, L L, and supplying and discharging pipes, all substantially as described.

70,444.—WINDOW FASTENING.—Geo. B. Kirkham, N. Y. city.

I claim the fastening complete with its several parts, the body, A, the double pointed bolt, B, the slide, C, the catch, E, and the key, as described and represented.

70,445.—HOT AIR FURNACE.—James A. Lawson, Troy, N. Y.

I claim, 1st, The radiators, D, constructed and operating substantially as described, that is to say, in such manner as to receive the heat at their junction with the fire chamber, divide the currents, and then converge or reunite them at the upper end of the said radiator.

2d, The employment of two sets or series of radiators, arranged and operating substantially as described for the purposes set forth.

3d, The employment, in connection with the two sets of radiators, of two horizontal pipes or conduits, E E, communicating with the upper ends of said radiators, and with the exit pipe, G, near their centers, substantially as described.

4th, The dome or roof of the fire chamber, so constructed as to extend up between the sets of radiators, substantially as and for the purposes described.

70,446.—ELASTIC SPRING FOR CARRIAGES.—Thomas Long, Vandalia, Ill.

I claim an india-rubber spring constructed substantially as herein described.

Also, the combination of an india-rubber spring, constructed as described, with an elliptic spring, for the purpose set forth.

70,447.—BLAST FURNACE.—F. W. Lurmann, Osnabruck, Prussia.

I claim, 1st, The slag discharge piece, D, constructed and arranged substantially as described.

2d, The slag discharge piece, D, in combination with the plate, C, to which it is netted, substantially as described.

3d, The shape of the discharge opening or openings of the piece, D, being made flaring at its ends, and of diminished diameter in the middle or central part, substantially as described.

4th, Combining with the slag discharge piece a series of water channels or pipes, substantially as and for the purpose above set forth.

5th, Combining with the metallic plate, C, a series of water channels or pipes, substantially as and for the purpose above set forth.

6th, The method of controlling the discharge of slag from blast furnaces, by regulating the temperature of the slag discharge piece, substantially as described.

70,448.—BED BOTTOM.—J. I. Mabbett, Titusville, Pa.

I claim the slats, a b, open at one end, and connected at the other, combined with cross pieces, c d, blocks, g h, and rubber springs, i i, connecting the bottom with the bedstead, when all are arranged as set forth and described.

70,449.—MACHINE FOR CUTTING STONE.—James W. Maloy, Boston, Mass.

I claim, 1st, The combination of the spindle, which carries the cutting or finishing tool, with the adjustable block, g, substantially as and for the purpose described.

2d, The adjustable block, g, carrying the spindle, whether the latter is vertical or horizontal, in combination with the movable cross head, e, as set forth.

3d, The pointer, k, in combination with the adjustable block, g, and spindle, h, substantially as and for the purpose specified.

4th, The former, c, in combination with the cutting and polishing mechanism, substantially as set forth.

5th, The combination, with a sliding table, b, and rotating portion, c, of a former, c', as specified.

6th, The combination of the movable pointer, k, with the former, c', when operating substantially as and for the purpose described.

70,450.—MILK CAN.—Hugh L. McAvoy, and Ezekiel Mills (assignors to E. Mills), Baltimore, Md.

We claim, 1st, The milk can, with spiral metallic strengthening stays around its cylindrical portion.

2d, The combination of the solid metal neck, F G, with the screw cap, H J K, when constructed and arranged as and for the purposes specified.

70,451.—EVAPORATOR FOR SORGHUM AND OTHER SIRUPS.—Solomon McWorter, Barry, Ill.

1st, I claim the combination and arrangement of the evaporatng pan, A, and the steam boiler, B, substantially as described and set forth.

2d, The combination of the pipe, D, with the boiler, B, as and for the purpose set forth.

3d, The employment of the stiffening ribs, a, in combination with the flat crown sheet of the boiler, as described and set forth.

70,452.—COTTON BALE TIE.—Henry B. Merritt, St. Louis, Missouri, assignor to J. H. Merritt, Memphis, Tenn.

I claim a tie piece, A, when constructed substantially as described and set forth.

70,453.—FOUNTAIN PEN.—George Rudolph Metten, St. Louis, Mo., assignor to Horace Baldwin, Painesville, Ohio.

I claim, 1st, In combination with an air-tight and flexible ink sack, which is applied within the handle or holder of a fountain pen, so as to be free to collapse as the ink flows from it, I claim a tube, e, which extends beneath the pen, f, and is provided with a valve, g, at the point or discharge, so that in the act of writing the ink shall be caused to flow to the pen with greater or less freedom, according to the force and rapidity of the strokes, substantially as specified.

2d, A fountain pen, which is provided with a thin, air tight, flexible sack, applied within the pen handle or holder by means of a ring, c, in combination with a removable pen sheath, and supply tube, e, substantially as described.

3d, In combination with the flexible sack, b, and ink supply tube, e, I claim the conical valve or plug, g, acting as a regulator during the act of writing, and serving to close the aperture when there is no pressure applied to the nib of the pen, substantially as described.

70,454.—LUBRICATING OIL.—Cyrus Moore, East Saginaw, assignor to himself and Abel Blakeslee, Detroit, Mich.

I claim, 1 t, The method of manufacturing a lubricating oil by the process described.

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2d, The use of the ingredients, and in the proportions substantially as described, for the purpose designed.

70,455.—COMPENSATING FORGE CRANE.—Thomas Morris, Clarbeston, England, assignor to himself, John Morris, and Thomas C. Knowles.

I claim the lever, P, adjusting weight, R, and chain, q, in combination with the weight, L, sheaves, j, chain, k, and carriage, F, arranged and operating substantially as and for the purpose set forth.

Also, in combination therewith, the lever, W, and its connecting rods or chains, y y, operating substantially in the manner and for the purpose specified.

Also, the guides, S S, and step bolts, u u, provided with elastic shields, v, arranged and operating with the lever, P, for the purpose and in the manner described.

70,456.—HOSE COUPLING.—Andrew J. Morse, Boston, Mass.

I claim, in combination with the tail piece of the coupling, having a screw thread upon its outer surface, the encompassing ring having two screw threads, one for screwing upon the outer surface of the hose, and the other for connecting the ring to the tail piece, substantially as set forth.

Also, the recess, l, and tapering screw or surface, f, in combination with the encompassing ring and tail piece, substantially as set forth.

Also, the screw threads at the respective ends of the encompassing ring, h, made to run in opposite directions, substantially as described.

70,457.—IMPLEMENT FOR TRANSPLANTING FLOWERS, ETC.—Edgar G. Nichols, Beaufort, S. C.

I claim, 1st, The making of a transplanter in two separate and similar parts which, when united, inclose the roots of the plant and the soil next to them, preventing the soil from falling away from the roots in removing.

2d, The so curving or bending, or manufacturing of the blades, as shown in this specification and the drawings annexed, or the making of them in any manner which is substantially the same, that while they inclose the necessary space, yet shall they enter the soil with the least possible disturbance thereof.

3d, The shaping of the lower end of the shank to reach across the top of the blade, stiffen it, and allow thinner metal to be used for it.

4th, The making of a portion of the shank horizontal, forming a step for the foot to drive down the blade.

5th, The flattening of the handles on the sides approximating, to prevent slipping or rolling of the handles when clamped together.

6th, The making of a transplanter with handles so long that it can be used without any stooping at any part of the process, saving thus the largest and most unhealthy part of the labor.

70,458.—MACHINE FOR CUTTING TEETH OF FILE BLANKS.—Hiram Bassett Nickerson, Boston, Mass., assignor to Stillman B. Allen, Frank A. Allen, J. H. Winsor, and George B. Amy.

I claim the combination as well as the arrangement of the two cutters, A and B, provided with mechanisms for raising and depressing them, as specified, with the file-supporting carriage, C, having mechanism for imparting to it an intermittent motion in one direction, substantially as and for the purpose hereinbefore explained.

And I also claim the combination of such mechanism substantially as described, or its equivalent, for arresting the operation of a cutter, and its depressing mechanism or hammer, and maintaining such out of action preparatory to and while the other cutter and its operative mechanism may be at work, to produce the balance of the cuts to be made by such cutter last mentioned, the said additional mechanism being the cam bar, r2, the levers, s' t', the rod, u', latch lever, v', connecting rod, w', and springs, x' and y'.

Also, the combination of parts constituting such additional mechanism.

And in combination with the file-supporting carriage, C, its operative mechanism, and the two cutters, A B, provided with mechanism for effecting their elevations and depressions, I claim mechanism substantially as described, or its equivalent, for gradually increasing the force of the blow of a hammer while the cutter thereof may be passing from the narrower to the wider parts of the file blanks, as explained, such last mentioned mechanism being the pattern guide, m', stud, n', forked lever, o', projection, p', wedge, q', and buffer, m, arranged as explained.

Also, the combination of the guide, m', stud, n', forked lever, o', projection, p', wedge, q', and buffer, m, the whole being for the purpose as explained.

And in combination with the file-supporting carriage, C, its operative mechanisms, and the two cutters, A B, and their mechanisms for effecting their proper elevations and depressions, I claim the spring presser or its equivalent.

Also, the combination of the self-adjusting cutter head, with the carrier slide, b, and the force transmitter, c, applied to the carrier as set forth.

Also, the combination or mechanism for operating the feeding-screw, such consisting of the ratchet, x, the pawls, y z, rocker levers, a' b', levers, e' f', and rods, c' c', rod, k2, hoop, l', and eccentric, f, arranged, constructed, and applied together so as to operate as specified.

70,459.—EYES FOR PICKAXES.—George Nimmo, Jersey City, N. J.

I claim the eye for pickaxes and other tools, formed in the manner and for the purposes specified.

70,460.—PROPELLER FOR VESSELS.—Charles M. O'Hara, London, England.

I claim, 1st, A propeller, for vessels of navigation, made of sector form, and hung or suspended, so as to operate or oscillate in a vertical plane, substantially as shown and described.

2d, Driving or operating the propellers by means of engines, the cylinders or steam chambers of which are of curved form longitudinally, and provided with circular piston rods substantially as shown and described.

3d, The plates, H, in combination with the oscillating propellers, C C, substantially as and for the purpose specified.

70,461.—COVER FOR TEA-KETTLES, ETC.—William W. Page (assignor to Arnold H. Holdridge and Daniel E. Paris), Troy, N. Y.

I claim a bail and cover combined to vessels or kettles constructed with a cam or bulge at or near one end of the bail, so that it will operate on an arm, or one end of the cover, to raise it upward and let it down as the bail is shifted from side to side, when constructed substantially as herein described and set forth.

70,462.—GRATE.—Peter A. Palmer, Troy, N. Y.

I claim the alternate stationary bars, B, in combination with the shaft, C, bars, E, and frame, A, or their equivalents, as and for the purposes herein set forth.

70,463.—BREECH-LOADING FIRE-ARMS.—William R. Pape, Newcastle-on-Tyne, Great Britain.

I claim the vertical rotating spindle, carrying beveled catches, 1 and 2, and spring, 6, operating in combination with the lumps, D, and horizontal slots, B and C, in the rear of the breech, substantially as and for the purposes specified.

70,464.—TAG.—Robert Parks, Philadelphia, Pa.

I claim the tag, A, constructed with cuts or incisions, a a, and parts, b c d or b d, folded over and secured substantially as and for the purposes set forth.

70,465.—WATCH-KEY.—Eugene Paulus, Philadelphia, Pa.

I claim a combined watch-key and push-piece, which is made a steady part of the case, the head or winding crown being directly screwed in the pendant, leaving the pipe free and movable, so as to act on the case spring to open the watch, and also to wind it up by taking it out, the whole constructed and operating substantially as described.

70,466.—ROPE-MAKING MACHINE.—Howard Perkins, Mansfield, Mass.

I claim the self-adjusting regulators, K, constructed as described, in combination with their elastic cords, N, as and for the purposes set forth.

70,467.—FRAME FOR SUSPENDING MAPS.—Wm. F. Phelps, Winona, Minn.

I claim, 1st, A horizontal bar, having longitudinally sliding arms, provided with hooks, substantially as described and for the purpose set forth.

2d, The standard, E, having steps, K, in connection with the sliding standard, D, and spring, I, when arranged to operate as shown and described.

3d, The adjustable standard, E, and horizontal bar, A, provided with the sliding arms, C C, when arranged to operate as described for the purpose set forth.

70,468.—WINE PRESS.—A. L. Rand, Peoria, Ill.

I claim, 1st, The box, A, provided with the perforated plates, g, lifting plate, e, and dripping-board, m, and inclined chute, I, when constructed and arranged to operate substantially as described and for the purpose set forth.

2d, The screw-rod, F, in combination with the tubular column, G, lifting-plate, e, followers, h i j, lever H, and rod, E, when constructed and arranged to operate substantially as described, and for the purpose set forth.

70,469.—GAME TABLE.—Louis Raymond, Rockland, Del.

I claim the combination of the circular recessed and figured platform, the horizontal, circular, covered or enclosed way, and the abutment or deflecting surface, D, all arranged as and for the purpose herein described and represented.

70,470.—CHURNS.—Thomas Rettew, West Vincent Township, Pa.

I claim, 1st, The churn, A, as a whole, when constructed, arranged, and operating as shown and described.

2d, Encasing the lower part of the churn to form a chamber for the circulation of air, as shown and described.

3d, The wheel, D, plate wheel, m, and the detent, n, as shown and described.

70,471.—TEMPERING SEEEL.—Asa R. Reynolds and Napoleon B. Reynolds, Auburn, N. Y.

We claim tempering articles made in whole or in part of steel, by means of a head of flowing water, and a guiding and holding hardening, or tempering head, substantially as herein described.

70,472.—HORSE-HOE.—T. Rice and Luke R. Hitchcock, Canadea, N. Y.

We claim the combination of the curved perforated braces and hoe, as shown by figs. 1 and 2, for the purpose of cultivating garden and field crops in the best and most desirable manner.

70,473.—HITCHING-STRAP.—A. J. Ross, Rochester, N. Y., assignor to O. C. Ross, Penfield, N. Y.

I claim the strap or cord, B, provided with the length, i, for passing over and around the horse's head and through the rings of the bit, and the buckle, k, or equivalent, for fastening tightly under the chin, the whole arranged and operating in the manner and for the purpose herein set forth.

70,474.—PREPARATION OF PAPER-PULP FROM REEDS, &c.—Robert W. Russell, Brooklyn, and Thomas Howland, Stockport, N. Y.

We claim, 1st, The above mentioned process of making paper-pulp, papier-mache, and other articles, from vegetable fibrous substances, disintegrated as aforesaid by the said steam-blowing process, without maceration, boiling or chemicals.

2d, The method of treating vegetable fibrous substances which have been subjected to the said steam-blowing process for the purposes aforesaid, by beating, grinding, crushing, or bruising, and washing the same, before the boiling of the same in any chemical solution, substantially as described.

3d, The new articles of manufacture above described, that is to say, pulp of different kinds, suitable for the manufacture of paper and papier-mache, made either with or without the use of chemicals, substantially as above described.

70,475.—CARRIAGE-SEAT SPRINGS.—Wm. Scott, Plymouth, Mich.

I claim the arrangement and combination of the spiral spring, A, the socket, B, and the plate, C, provided with the circular flange, D, substantially as described for the purpose designed.

70,476.—MANUFACTURE OF REFINED INGOTS OF IRON AND STEEL.—Christian Shunk, Armstrong County, Pa.

I claim the employment and the application of certain metals, herein set forth (or an equivalent, or either of the same separate from the other), in the refining and converting molten crude iron into refined ingots of iron and steel, or semi-steel, by the pneumatic process, and of bar or wrought iron converted into refined steel ingots by the "pot" or crucible mode for melting the iron.

70,477.—PORTABLE GAS-GENERATING FURNACE.—Wm. M. Sloane, Buffalo, N. Y.

I claim, 1st, The combination and arrangement of the vaporizing chamber, B, with a common heating furnace, or stove, A a1 a2, for the purpose and substantially as described.

2d, The combination and arrangement of the retorts, C C, with the fire-chamber of a common heating furnace, or stove, for the purpose and substantially as herein described.

3d, The combination and arrangement of the furnace, or stove, A a1 a2, vaporizing chamber B, retorts C C, and conducting pipe, d, in the manner and for the purpose substantially as set forth.

4th, The valve, G, for automically regulating the supply of the hydro-carbon fluid to the vaporizing chamber, B, substantially as described.

5th, The valve, H, for automatically removing or conducting the surplus gas into the smoke flue of the furnace, substantially as described.

6th, The combination of the gasometer, J, gas pipe, E, branch pipe, h', and waste valve, H, for operating in the manner and for the purpose substantially as herein described.

70,478.—ROOFING COMPOUND.—George O. Smith and J. H. Smith, Chicago, Ill.

We claim a roofing compound of the ingredients herein named, substantially as set forth.

70,479.—METAL PLANERR.—Jas. Hervey Sternbergh, Reading, Pa.

I claim the combination as well as the arrangement of the emery-wheel, E W (or other grinding or polishing wheel or stone), adjustable at various heights to suit the work, by means of the screw, C, in connection with movable table, T T, carrying the slide rest, S R, and vise, V V, or other suitable arrangement for holding the article to be planed or ground off, for the purpose mentioned, substantially as set forth and described.

70,480.—MAIL BAGS.—Edward Sevens and John A. Knight, St. Louis, Mo.

We claim the bar, B2 the loop, b1, and the partition, B1, combined and operated as herein shown and described.

70,481.—MACHINE FOR CUTTING SOLES OF BOOTS AND SHOES.—Edgar M. Stevens, Boston, Mass.

I claim, 1st, The spindle, C, constructed with the spiral and straight grooves in combination with the adjustable spring rod, p, when operating in the manner and for the purpose set forth.

2d, The gauge, h, in combination with the lever, g g', and tripping device, i, substantially as and for the purpose described.

3d, The arm, F, attached to the cross-head, D, and provided with a dog, d, and trigger, G, in combination with the knife-head, E, as and for the purpose described.

4th, The adjustable and detachable scrap cutter, K, as described.

5th, The combination of the cutter, K, the block or holder, I, and the knife-head, E, as described.

6th, The spindle, C, constructed with the spiral and straight slots or grooves, as described.

70,482.—MOLD FOR CASTING CAR-WHEELS.—John Blake Tarr, Chicago, Ill,

I claim a lining of the form of a car-wheel, made of soapstone or other analagous solid refractory material, in combination with a strong sectional metal casing, such lining being in sections and applied within the sectional metal casing, so as to be adapted for giving form to a cast-steel car wheel, and the casting and lining of such strength combined as to be capable of sustaining the pressure which is requisite to insure a condensation of the steel of which the wheel is cast, all substantially as herein set forth.

70,483.—LATHE-WAY SMOOTHERS.—Alfred Thomas, Worcester, Mass.

I claim, 1st, the combination with the frame, C, cross-bar, L, piece. K, and slide piece, E, of frame, F, shaft, H, and smoothing-wheel, J, substantially as and for the purposes set forth.

2d, The combination of the smoothing-wheel, J, shaft, H, and pulley, I, with the side-piece, E, substantially as and for the purposes set forth.

70,484.—WIRE-BELLS FOR CLOCKS.—Hiram C. Thompson, Bristol, Conn.

I claim, 1st, The coil or ring, A, when formed on a wire bell, substantially as and for the purpose set forth.

2d, The bell-stand, figs. 2 and 3, substantially as and for the purpose described.

70,485.—MODE OF TREATING VEGETABLE SUBSTANCES FOR MAKING PAPER PULP.—Benj. C. Tilghman, Philadelphia, Pa.

I claim the process of treating vegetable substances which contain fibres with a solution of sulphurous acid in water, either with or without the addition of sulphites, or other salts of equivalent chemical properties, as above explained, heated in a close vessel under pressure, to a temperature sufficient to cause it to dissolve the intercellular incrusting or cementing constituents of said vegetable substances, so as to leave the undissolved product in a fibrous state, suitable for the manufacture of paper, paper pulp, cellulose, or fibres, or for other purposes, according to the nature of the material employed.

I also claim as new articles of manufacture the two products obtained by treating vegetable substances which contain fibres with a solution of sulphurous acid in water, either with or without the addition of sulphites, or other salts of equivalent chemical properties, as above explained, heated in a close vessel under pressure to a temperature sufficient to cause it to dissolve the intercellular or incrusting constituents of said vegetable substance, one of said products being soluble in water, and containing the elements of the starchy, gummy, and saline constituents of the plants, and the other product being an insoluble fibrous material, applicable to the manufacture of paper, paper pulp, cellulose, or fibres, or to other purposes, according to the nature of the material employed.

I also claim the use and application, in the manufacture of paper, paper pulp, cellulose, and fibres, of the fibrous material produced by treating vegetable substances which contain fibres with a solution of sulphurous acid in water, either with or without the addition of sulphites, or other salts of equivalent chemical properties, as above explained, heated in a close vessel under pressure to a temperature sufficient to cause it to dissolve the incrusting or intercellular constituents of said vegetable substances.

I also claim the use and application of sulphites or other salts of equivalent chemical properties, as above explained, in combination with a solution of sulphurous acid in water, as an agent in treating vegetable substances which contain fibres, when heated therewith in a close vessel under pressure to a temperature sufficient to cause said acid solution to dissolve the intercellular or incrusting constituents of said vegetable substances.

I also claim the recovery and re-use of sulphurous acid and sulphite from the acid liquids which have been digested on the vegetable fibrous substances, by boiling said liquids, or neutralizing them with hydrate of lime.

70,486.—APPARATUS FOR CASTING CAR WHEELS.—Samuel H. Whitaker, Covington, Ky,

I claim, 1st, A flask for casting together two or more metals, consisting of the drag, F, curb, I, cope or cut-off, J j, suspended head, K, and gates, N and O, the whole being combined and adapted to operate as set forth.

2d, In the described combination, the flask, F I J j K N O, and press, A B C D E, or their equivalents, for casting a steel rim, and compressing and welding the same around an iron web or body while in a semi-molten condition, as set forth.

3d, The parts, A, B, C, D and E, forming a press for compressing the steel tire of a car wheel, while in a semi-fluid condition, as set forth.

70,487.—WINDOW SASH FASTENER.—Chester F. Wickwire. Cortland, N. Y.

I claim, 1st, The slotted bent lever b, operating upon the pin, d, for the purpose of holding the sash in position when raised.

2d, The slotted lever, b, in combination with the slotted plate, g, for the purpose of locking or permanently fastening the sash when down, or locking it at any particular point.

70,488.—FASTENING EYELETS.—Wm. W. Wilcox, Middletown, Conn.

I claim, 1st, The arrangement of a rough surface ring, b, between the flange of an eyelet and the material to which the same is to be fastened, substantially as and for the purpose described.

2d, Providing the rough surface ring, when used in combination with an eyelet, with oblique teeth, as and for the purpose set forth.

70,489.—BED BOTTOM.—H. W. Williams, Stowe, Vt.

I claim the flat steel springs, A, their sliding boards, B, with connecting rods, C, and horizontal levers, D, when arranged and combined as herein described, and for the purposes set forth.

70,490.—TIP FOR THE FEET OF CHAIR LEGS.—Edward S. Winchester, Boston, Mass.

I claim the India rubber tip constructed as described, that is, formed as a ferrule, to be placed upon the foot of the chair, the ferrule increasing in thickness from its center, B, to its open end, A; also increased from its center, B, to the closed end, or base thereof, on which the foot of the chair rests.

70,491.—SLEDS.—A. T. Woolsey and A. F. Hubbell, Sandusky, Ohio.

We claim the construction of a runner, A, and side rail, A', of one entire piece, in the manner and for the purpose set forth.

70,492.—CAR TRUCKS.—Walter Youmans, Lansinburg, N. Y.

I claim connecting the body or platform of the car with the truck frame or frames, substantially as described, so that the former shall be free to move up and down on the latter with springs interposed, and so that the body, or platform shall not move longitudinally or laterally independently of the truck frame, or frames, when this is combined with the connection of the axles with the truck frame, so that the said axles shall be free to move under it, substantially as described, and by the means described, or the equivalents thereof

And I also claim connecting the ends of the under bolster with the wheel axles by means of clamping blocks, substantially as described, in combination with the double cross bars, or the equivalent thereof, connected with the clamping blocks both above and below the horizontal plane of the axes of the wheel axles, substantially as and for the purpose specified.

70,493.—HATS.—Daniel K. Albright, Philadelphia, Pa., and Leo H. De Lange, Bordentown, N. J.

We claim, 1st, The band, D, connected to the body and brim of a hat, and arranged in respect to the same substantially as and for the purpose herein set forth.

2d, The holes, e, in the brim, and the holes, d, in the body of the hat, in combination with and arranged in respect to the band, D, as described.

70,494.—GAS STOVES.—Chas. E. Alden, Philadelphia, Pa.

I claim, 1st, The casing, B, wire gauze or perforated plate, F, and holes, i i, in combination with the adjustable casing, F, the whole being constructed and arranged substantially as and for the purpose herein set forth.

2d, The combination of the above internal tube, m, and valve, n.

70,495.—HEATING AND VENTILATING APPARATUS FOR RAILWAY CARS.—C. F. Allen and L. W. Campbell (assignors to themselves, A. T. Hall and A. I. Ambler), Aurora, Ill.

We claim, 1st, The combination of the grating, G, and sieve, D, with the bonnet, A, partitioned pipe, C Q g, pipe, L, water chamber, E' or M, and register pipe, R x, substantially in the manner and for the purpose described.

2d, The combination of the chamber, E, chamber, M, warming apparatus as described, and register pipe, R x, substantially in the manner and for the purpose described.

3d, The construction of the warming apparatus for a car or coach, in the manner substantially as described, and arranging the ventilator in such relation thereto that the portion of the air forced into the ventilating pipes will be employed for promoting combustion, while the other or greater portion is heated and distributed in the car, all substantially as described.

4th, The register, F, applied to the ascending conduit, Q, above the water chamber, E, substantially as described.

70,496.—NAIL MACHINE.—John M. Allen, Cambridge, Mass.

I claim a machine for cutting nails, without waste, from plate or sheet metal, in which the dies are formed longitudinally on the surfaces of the rollers, in the manner and for the purpose described.

70,497.—RAILWAY CHAIR.—Peter Allen (assignor to himself, L. Valliquette and Cleophus Brodeur), Rutland, Vt.

I claim the plate, B, in combination with the plate, B', with the tongue, b, fitted in a recess in the bed, a, constructed and secured with screw bolts and spikes, as herein described.

70,498.—ANCHORS.—W. J. Armstrong and Charles Browne, Brooklyn, N. Y.

We claim, 1st, Attaching the crown, B, to the shank, A, by passing a tenon formed upon the lower end of said shank through a mortise formed in the said crown, and securing them in place by blocks, D, firmly attached to the side of the projecting end of said tenon, substantially as herein shown and described, and for the purpose set forth.

2d, Forming the stock, E, in two parts, and attaching them to the upper end of the shank, A, by passing tenons formed upon the inner ends of said parts through a mortise formed in the upper end of said shank, and securing them in place by means of blocks, F, firmly attached to the projecting ends of said tenons, substantially as herein shown and described, and for the purpose set forth.

70,499.—SNAP HOOK.—C. H. Atwood, New Britain, Conn.

I claim, 1st, the snap hook constructed as described, consisting of the circular solid plate, A, having loop, B, and lugs, a, cast upon it, between the latter the straight bar, D, pivoted and held in place against the turn-up end, C, by means of the spring, c, as herein set forth, for the purpose specified.

2d, The casting of the projection, C, with the plate, A, in the same plane with the same, and then bending C in hook form, substantially as and for the purpose specified.

70,500.—CARD RACKS.—E. D. Averell, New York city.

I claim the arrangement on a curved or circular surface of a stand or frame of a coiled wire or spring and forming in combination with said stand or support a card or paper holder, essentially as herein set forth.

70,501.—WHIP ROLLING MACHINE.—Henry Axtell, Huntington, Mass.

I claim, 1st, A device for roiling whips consisting of a frame, A, having a reciprocating bar, J, an adjustable bar, G, between which the whip is rolled the bar, J, being operated by power and the bar, G, by the levers, F and F', with their treadle attachment, the whole being arranged substantially as and for the purpose described.

2d, The device for drawing the whip through the rolling machine consisting of the cord, k, having the weight, m, passing over the pulleys, g and g', in combination with the rest of my machine, substantially as described.

70,502.—HORSE YOKE.—Thomas J. Barnes, Cambridge, Ill.

I claim, 1st, An improved horse yoke made in two parts, A and B, and in substantially the form and manner herein shown and described.

2d, The combination of the short chains, C, and equalizing bar, D, to which the draft chain is attached with the parts, A and B, of the yoke, substantially as herein shown and described and for the purpose set forth.

70,503.—COTTON-BALE TIE.—J. W. Barnum, New Orleans, La

I claim the device herein described and as shown upon the drawings when provided with the two overlapping semi-annular grooves or curved supporting points, A A', as described when constructed as described and used for fastening the ends of wire rope or of common untwisted wire that is employed for banding cotton bales, as set forth.

70,504.—PNEUMATIC RAILWAY.—A. Ely Beach, Stratford, Ct.

I claim, 1st, The enlargement of the tube at or near the stopping station, substantially as and for the purpose herein shown and described.

2d, The method of preventing the leakage of air at the openings, substantially as herein shown and described.

3d, The method of supporting the cars and rails, substantially as herein shown and described.

4th, The recess, F, for lighting the tube, substantially as herein shown and described.

70,505.—CAR COUPLING.—G. M. Beardsley, Fenton, Mich.

I claim the double hooks, D D, with operating arms and levers in combination with the arrow-headed coupling bar its frame and springs, all constructed and arranged as described and for the purpose as set forth.

70,506.—CANE AND UMBRELLA COMBINED.—Henry Beebe, Hudson city, N. J.

I claim, 1st, The two tubes, B F, in combination with the handle, A, and body, E, of the cane or umbrella stick and locked together by the T-shaped slots and the shaft, k, of the lamp burner, substantially as shown and described.

2d, The sleeve, D, drawn over the tube, B, and provided with openings, e e', and the mica or other transparent material, f, secured between them in combination with a cane or umbrella stick, substantially as and for the purpose specified.

3d, The perforated tube, I, in combination with the two tubes, B F, provided with the cross slots and the lamp, G, substantially as and for the purpose set forth.

4th, The conical wire cloth or perforated metal tube, C, secured within the tube, B, provided with openings, a, the tube, F, and lamp, G, in combination with a cane or umbrella stick, substantially as and for the purpose specified.

70,507.—ADJUSTABLE CALKS FOR HORSESHOE.—William Jones Berne, Cincinnati, Ohio.

I claim, 1st, The mode or securing the sockets, A, by means of the set screws, A2, arranged to operate in combination therewith, substantially as set forth.

2d, In combination with the sockets, A, the use of an elastic substance, A3 interposed between the heel of the shoe and the socket, substantially as set forth.

3d, The toe piece, B, rigidly attached to the cross piece, C, for attaching the same to the shoe, substantially as set forth.

4th, In combination with the toe piece, B, the front extension, B2, hinged thereto, and arranged to operate substantially in the manner set forth.

5th, The combination of the cross piece, C, the toe piece, B, hinged extension, B2, of the toe piece, rods, E, and straps, D, attached to the sockets, A, substantially as set forth.

70,508.—WASHING MACHINE.—Joseph Bevis, Putnam, Ohio.

I claim, 1st, The combination of the stationary washboard, B, movable washboard or presser, C, and cam, D, with each other and with the tub, A, substantially as herein shown and described and for the purpose set forth.

2d, Connecting the movable washboard, C, to the cam, D, by means of the yoke, G, crosshead or bar, H, bolts, I, and spring, J, or by an equivalent adjustable and elastic device, substantially as herein shown and described and for the purposes set forth.

3d, The combination of the swinging frame, N, having a canvas or equivalent bottom, R, attached to it with the washboards, C and B, substantially as herein shown and described and for the purpose set forth.

70,509.—SOLAR CAMERA.—Lyman G. Bigelow, Albion, Mich.

I claim, 1st, The universal jointed connection, K, constructed and arranged substantially as described for the purposes set forth.

2d, I claim operating a solar-printing camera from east to west and to and from the zenith (being a combination of two motions) by turning a single screw, substantially as shown and described.

70,510.—PREPARING CEMENTS FROM SLAGS.—John James Bodmer, Newport, Great Britain.

I claim the use of slag or scoria produced by blast or other furnaces (or when produced by other means), in combination with lime or with lime and alumina in the formation of cement, substantially as described.

70,511.—DEVICE FOR OPERATING FOLDING VALVES.—Eugene Bourden, Paris, France.

I claim the combination with the valve, and suitable orifice or orifices formed therein, of the membraneous or flexible valve, and lever for operating the same, substantially as and for the purposes herein set forth.

70,512.—CARBURETING GASES AND AIR.—John F. Boynton, Syracuse, N. Y.

I claim, 1st, In a apparatus for carbureting gas for illuminating purposes, the use of double perforated walls, B B, having a suitable capillary substance confined between them, said walls being so arranged as to form a porous division through which the gas is forced, substantially as described.

2d, The forming of two compartments in a vessel, by means of an upright double-walled partition, which is rendered sufficiently porous to allow of the absorption of the fluid in said vessel, and the passage of gas through it, substantially as described.

70,513.—ALLOY FOR THE MANUFACTURE OF METAL SHEETS, FOIL, ETC.—Leopold Brandeis, Brooklyn, N. Y.

I claim to produce metal sheets of any thickness, perfectly pliable, not easily acted upon by weather and temperature, of great strength and durability, for roofing, plumbers', tinmens', and chemical use, for grocers, tobacconists, perfumers, and confectioners, by making an alloy of lead and other metals in suitable proportions and shape by protecting this alloy with a coat of tin surrounding it, and to produce from this alloy, so prepared, sheets or leaves of any size and weight, and for the device of application of hot water or steam between the rollings.

70,514.—WOOD PAVEMENT.—J. L. Brown, New York city.

I claim the employment of arched formation timbers, laid crosswise of the the street, in combination with any suitable earthy foundation, and sections of wooden pavement resting upon such foundation, and overlapping the arched timbers, substantially as described.

70,515.—BLACKING BRUSH.—G. H. Burdon, Waltham, Mass.

I claim the combination and arrangement of the brush, E, with the grooved head, G, ring, I, spring, M, joint, J, holder, A, and blacking box, L, substantially as described for the purpose specified

70,516.—MILK CAN.—N. C. Burnap, Argusville, N. Y.

I claim a milk can when provided with a rounded connection between sides and bottom, and when combined with a similarly rounded protecting bottom, B, having a flange, a, and with a ring, C, all made substantially as and for the purpose herein shown and described

70,517.—CARRIAGE SEAT BACKS.—John Burt, Sturgis, Mich.

I claim the within-described vehicle seat, in which the back and ends, with round corners, are formed from a single piece of wood of proper length and thickness, shaped and bent to the desired shape, as set forth and described.

70,518.—MASH COOLER.—Franklin P. Bush (assignor to himself and Jeptha Garrard), Cincinnati, Ohio.

I claim, 1st, The arrangement of tun, A, central annular waste way, D

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rotary centrally discharging coils, J, central supply pipes, G I, stuffing box, H, and rake, L, for the purpose set forth.

2d, In the described combination the rotary coils, J, discharging into a central waste way, D, in the manner set forth.

70,519.—MACHINE FOR SHARPENING CALKS OF HORSESHOES.—William M. Butler, Waukegan, Ill.

I claim, 1st, A machine for sharpening horseshoes, made and operating substantially as herein shown and described.

2d, The device for moving the cutter, C, forward or backward consisting of the spring, g, nut, f, and shaft, B, all made and operating substantially as herein shown and described.

3d, The device for moving the cutter laterally consisting of the slotted frame, A, screw, k, sleeve, l, and shaft, B, all made and operating substantially as herein shown and described.

4th, The frame, A, when provided at the corners with projections, a, and setscrews, b, so as to be easily fastened on any sized shoe and when provided with slotted flanges, h h, and bolts and nuts, i, for the same purpose, substantially as set forth.

70,520.—SHIPS' COMPASS.—James, Earl of Caithness, Middlesex county, England.

I claim the combination of a mariner's compass and a weighted pendulum secured to the compass box and having near the upper end a ball which fits in a stationary socket, all substantially as and for the purpose described.

70,521.—PISTON PACKING.—Luther W. Campbell Aurora, Ill., assignor to himself, A. T. Hall, C. F. Allen and A. J. Ambler.

I claim, 1st, So arranging a series of concentric elastic rings, K G and E, having alternately inclined faces that acting in combination with the conical hub, A, and packing rings, H H, they shall maintain an uniform outward pressure upon the latter by the action of the steam alternately entering each end of the cylinder, substantially as set forth.

2d, The combination of the perforated heads, B B', conical hub, A, and rings, E F G K and H, arranged to operate substantially as set forth.

70,522.—PISTON PACKING.—Luther W. Campbell, Aurora, Ill., assignor to himself, A. T. Hall, C. F. Allen and A. J. Ambler.

I claim, 1st, So arranging a double series of concentric elastic rings, F G and H, that acting in combination with the central ring, E, having double inclined faces, E2, they may by the pressure of the steam, alternately admitted to the opposite ends of the cylinder, be alternately expanded, substantially in the manner and for the purpose set forth.

2d, The combination of the hub, A, perforated plates, B B', ring, E, having a central flange, E1, and double inclined faces, E2, and the concentric rings, H G and F, constructed and arranged to operate substantially as set forth.

70,523.—APPARATUS FOR RAISING AND SECURING THE LEGS OF HORSES TO SHOE THEM.—J. P. Champion, Phelps, New York city.

I claim the apparatus for raising and securing the legs of horses to shoe them safely, arranged and applied as he.ein shown and described.

70,524.—CYLINDER PRINTING PRESS.—Henry C. Chandler, Indianapolis, Ind.

I claim moving the bed, B, under the impression cylinder, C, at the time of making the impression by means of the pins, S, and standards, R, segmental cog bars, G, and cog bars, F, in combination with the devices for giving the return movement to the bed by means independent of that which carries it under the cylinder, in the manner substantially as set forth.

70,525.—TABLE CUTLERY.—Matthew Chapman, Greenfield, Mass.

I claim as a new article of manufacture table cutlery having the blade, bolster, and handle forged or swaged from one solid piece of steel, substantially as herein described.

70,526.—SLEIGH BELLS.—Cyrus R. Clark, Cobalt, Conn.

I claim attaching sleigh bells to their straps by means of two or more sheet metal plates, b b, which are secured to a shank, a, that is cast with the bell, A, all made substantially as and for the purpose herein shown and described.

70,527.—HORSE HAY FORK.—Mark Coffin, Milton, Ky.

I claim the arrangement of the rope, C, having the ring, F, knot, c', and trigger, E, with the bent tines, A D, pulley block, B, and rope, G, as herein described for the purpose specified.

70,528.—METHOD OF STOPPING AND STARTING CARS.—Elisha T. Colburn, Boston, Mass.

I claim the combination of the slide bar, D, and its locking pawls with the brake mechanism consisting of the levers, F, the blocks, G, the rope, I, and the wheel or wheels, H, the whole being substantially as specified.

I also claim, as an accelerating mechanism for a car, the combination of the slide bar, D, the rope, I, and the wheel or wheels, H, arranged and applied to the axles as set forth, the said bar, D, being connected to the draw bar or tongue of the car, as explained.

70,529.—COMBINED TOOL.—B. W. Collier, Oxford Miss.

I claim the instrument above described having the parts combined and arranged substantially as and for the purposes specified.

70,530.—CORPSE PRESERVER.—C. W. Compton, Newark, N.J.

I claim, 1, Forming the bottom or cooling board, A, in two parts hinged to each other, substantially as herein shown and described and for the purpose set forth.

2d, Forming an air chamber or chambers, a', in the bottom or cooling board, A, substantially as herein shown and described and for the purpose set forth.

3d, The ice chamber, D, extending down upon the sides of the trunk to or nearly to the bottom board, A, and extending around the head of the corpse, substantially as herein shown and described and for the purpose set forth.

4th, Forming the corpse preserver in three parts, A B C, substantially as herein shown and described and for the purpose set forth.

5th, Forming the adjacent ends of the parts B and C, inclined or wedge shaped, substantially as herein shown and described and for the purpose set forth.

6th, The combination and arrangement of the body chamber, G, ice chamber, D, and air chambers, a' E and F, substantially as herein shown and described and for the purpose set forth.

70,531.—WEIGHTS FOR SCALES.—H. W. Comstock, Lafayette, Ind.

I claim the substitution of glass in place of other substances as weights for weighing scales, thereby producing an anti-corrosive and cheaper weight, as specified.

I also claim a filled glass weight when so constructed that the material used as filling shall be entirely surrounded by the glass, as specified and described.

70,532.—ATTACHING WHEELS TO VEHICLES.—L. Crouch, Baraboo, Wis.

I claim the nut, E, provided with the screw thread upon its outer circumference and secured to the hub, A, by means of screws, in combination with the axle box, C, nut, E, and cap, E, substantially as described for the purpose specified.

70,533.—WAGON BRAKE.—Ezra N. Curtice, Spring Water, N. Y.

I claim, 1st, The brake shaft, F, supported in the boxes, a a, on the wagon reach and hounds and the straps, c c, on the braces, b b attached to the axle, A', arranged and operating as and for the purpose described.

2d, The eccentric arms, e e, on the ends of the brake shaft, F, in combination with the rubbsrs, d d, arranged and operating as described.

3d, The combination of the brake shaft, F, the rod, g, and the draft pole, E, arranged and operating as and for the purposes described.

60,534.—MANUFACTURE OF SUCTION BOXES FOR PAPER MAKING.—Francis Curtis, Newton, Mass.

I claim the improved manufacture of suction box as composed wholly or in part of hard rubber, substantially in manner and for the purpose as before described.

70,535.—SLEIGH KNEE.—Isaac Dan, Sanford, N. Y.

I claim the blocks, B and C, as constructed and used in combination with the knee and the bar, E, as and for the purpose set forth.

70,536.—SLEIGH KNEE.—Isaac Dan, Deposit, N. Y.

I claim the knee constructed of wood and metal in the manner herein set forth and used with the runner, for the purpose specified.

70,537.—GATE LATCH.—Alfred K. Davis, Carey, Ohio.

I claim the pivoted latch bars, D D', and connecting bar, E, and their respective equivalents, all as set forth in combination with the lever, F, operating and arranged in manner substantially as and for the purposes herein shown and described.

70,538.—FEED-WATER HEATER FOR STEAM GENERATORS.—John W. Doughty and Horatio B. Beckman, Newburg, N. Y.

We claim the chamber, T, with pipe, P1, in connection with the feed pump, or any other instrument of supply, well, W, blow off pipe, P2, steam-connecting pipe, Q1, water-communication pipe, E G Q2, with the cap, F, and boiler, B, as shown in the drawing, and for the purpose as set forth.

70,539.—STRAW CUTTER.—Stephen Elliott, Richmond, Ind.

I claim constructing a straw cutter, as above described, when the same is composed of the spiral spring, K, lever, B, cross piece, H, uprights, F and G, cross piece, D, lever, E, rod, I, and frame, A, arranged and operated substantially as above described.

70,540.—SYRINGE.—Jas. J. Essex, Newport, R. I.

I claim, 1st, The employment or use, in connection with a syringe, of a receiver or reservoir, A, provided with a glass or other transparent plate, Ax, and with a screw cap, b, and tube, B, substantially as and for the purpose set forth.

2d, The combinaton of a metallic and an elastic bulb, when the former are attached to opposite ends of the latter, and used either in connection with or without an air chamber, for the purpose specified.

3d, The rose zozzle, or douche, composed of the cup, i, and perforated plate, j, when used in connection or combined with a syringe provided with an elastic bulb, substantially as and for the purpose specified.

4th, Providing the male screw of the connections or joints with a socket, g, to receive the packing and prevent its lateral expansion under pressure, where the two parts of the connection or joint are screwed together.

5th, The arrangement of the rigid discharging pipe and the flexible suction tube and their valves at one end of the bulb, substantially as herein shown and described.

70,541.—SEED PLANTER.—H. C. Fairchild, Brooklyn, Pa.

I claim, 1st, The slide, D, operated from the outside by the screw, a, and the arm, c, substantially as described.

2d, The hole, d, through the cylinder, substantially as and for the purposes herein set forth.

70,542.—PAINT BRUSH.—Wm. H. Forker, Meadville, Pa.

I claim the cap, E, and the ferrule, F, forming the cup, E F, in combination with the cylinder, D, with the staves, J J J J, the conical nut, C, and the screw, H, when the same are constructed as described in the aforesaid combination, for the purposes set forth.

70,543.—CONDENSER FOR CARDING ENGINES.—Geo. R. Gardiner (assignor to himself and Benjamin W. Bentley), Westerly, R. I.

I claim, 1st, The roller, C, one or more, made either hollow or solid, and charged or covered with a composition, herein described, or its equivalent, and placed on a condenser, in relative position with the cylinders, B, thereof, substantially in the manner as and for the purpose set forth.

2d, The guards, G, attached to the guide bars, F, on frame, D, and arranged in relation with the ropings, a, substantially as and for the purpose specified.

70,544.—SCISSORS SHARPENER AND CLOTH RIPPER COMBINED.—A. W. Gifford (assignor to William A. Richardson and Henry D. Ward, Worcester, Mass.

I claim a combined scissors sharpener and ripper, constructed for operation substantially as described.

70,545.—MACHINE FOR SPLITTING WHALEBONE.—Nathan Goddard, Boston, Mass.

I claim the arrangement and combination of the series of knives, A B C D, and adjustable rollers, F, or the same and the adjustable throat piece, G, the whole being applied to a frame, E, substantially as and for the purpose specified.

70,546.—WEIGHING AND MEASURING CUP.—E. A. Goodes, (assignor to himself, E. L. Miller, and W. H. Morford), Philadelphia, Pa.

I claim a cup provided with scales, a b and c d, whereby it may be used for weighing and measuring purposes, in the manner substantially as herein set forth, as a new article of manufacture.

70,547.—LEVEL AND TRY-SQUARE.—J'n Graham, Ludlow, Vt.

I claim, 1st, The indicator, composed of a T-shaped bar, F, connected by a toothed segment, d, and pinion, e, or their equivalents, with an index, f, which traverses over a graduated ring, g, all being arranged and applied to a square, to operate in the manner substantially as and for the purpose set forth

2d, The combination of one or more supplemental movable or adjustable squares, G J, with a T or try-square, substantially as shown and described.

3d, The slide, I, provided with a bevelled or V-shaped notch, o, at one end, and a series of slots, p, at the opposite end, when said slide is applied to or used in connection with a T or try-square, substantially as and for the purpose specified.

4th, The plate, H, provided with the ribs, l m, and slot, n, when said plate is used in combination with a supplemental square applied to a T or try-square, substantially as and for the purpose set forth.

76,548.—FARM GATE.—Orson Graham, Lima, N. Y.

I claim, 1st, The collar, C, and collar, D, in combination with the gate, E, and folding part, F, when made and used substantially as specified.

2d, The folding part, F, when made as specified, and used in combination with the gate, E, substantially as specified.

70,549.—FENCE.—Isaiah M. Green, Sen., Clinton, Ill.

I claim the groove, C, in the post, A, and rod, D, passing through eyes in the ends of the wires, c c, in combination with the key, b, and their seats in the rails, B, all arranged and operating substantially as and for the purpose set forth.

70,550.—HAY RAKE.—Albert J. Greene, Sterling, Mass.

I claim, 1st, In a hand hay rake, the arrangement of the axle, B, teeth, C, blocks or hinges, D, rod, F, and shaft, E, with each other, substantially as herein shown and described.

2d, The combination of the spring or springs, G, with the rod, F, axle, B and shafts, E, substantially as herein shown and described, and for the purpose set forth.

3d, Adjusting the tension of the spring, G, by means of a thumb screw, H, substantially as herein shown and described.

4th, In a hand hay rake, the arrangement of the arm, K, and rod, L, with the axle, B, and shafts, E, substantially as herein shown and described, and for the purpose set forth.

70,551.—PHOTOGRAPHIC PROCESS.—Manfred M. Griswold, Columbus, O.

I claim, 1st, The black baked photographic plate, prepared substantially as hereinabove set forth, as a new article of manufacture.

2d, The composition of the enamel or collodion for producing the original white surface, substantially as described.

3d, Baking the plate subsequent to the application of the white collodion film, substantially as set forth.

4th, Restoring the white color to the surface of the plate, subsequent to its being baked, as set forth, or in any manner substantially the same.

70,552.—ANNUNCIATOR.—Henry Gross and George S. Yingling, Tiffin, O.

We claim, 1st, The self-controlling figure drops, B, constructed substantially as described, in combination with the upright guides, C, upon which they slide, as and for the purpose set forth.

2d, The double springs, D, constructed substantially as herein shown and described, in combination with the drops, B, and with the upright guides, C, as and for the purpose set forth.

3d, The levers, F, constructed substantially in the form and manner herein shown and described, in combination with the connecting rods, E, and double springs, D, for the purpose of releasing the drops, B, and with the tumbler, H, by means of which the bell hammer is operated, as and for the purposes set forth.

70,553.—ENGRAVING MACHINE.—J. C. Guerrant and B. J. Field, Leaksville, N. C.

We claim, 1st, The holder, A, adjustable in a horizontal plane upon a center coincident with the axis of rotation of the post which carries the graver shaft, substantially as described.

2d, The arrangement of the extensible rod, G G', connecting the tracing arm, H, with the graver arm, D, substantially as described.

3d, The adjustment of the connecting rod, G G', at the point of attachment to the tracing arm, so as to vary the degree of penetration of the graver, substantially as described.

4th, The rotating graver, D, in combination with the vibrating and counterpoised graver arm, D'.

5th, The vibrating slotted guide plate, K, constructed and operating substantially as described and represented.

6th, The guide rod, L, planted in the adjustable slide rest, M, and affording a guide for operating the cutter on a given vertical line.

70,554.—MODE OF ORNAMENTING GLASS SHADES AND GLOBES.—R. Guthrie and J. Shearer, New York city.

We claim the removable sectional glass ornaments or hangings for lamp shades and globes, arranged substantially as and for the purpose herein shown and described.

70,555.—HEAD REST.—Robert Hale, Chicago, Ill.

I claim the head rest, constructed as described, consisting of the cap, A, having the neck strap, C, the adjustable strap, D, secured at one end to the visor, B, and at the other by a hook, E, to the roof of a car, or an equivalent support within the car, as herein described for the purpose specified.

70,556.—REVERSIBLE CHAIR SEAT.—Mathias Hamburger, New York city.

I claim the reversible seat, B, when hinged, by means of pins, a a, in the chair frame, A, and when combined with the stop, b, and pin, C, all made and operating substantially as herein shown and described.

70,557.—FURNACE.—David Harger, Des Moines, Iowa.

I claim the combination of the pipe, A, having the apertures, a a, and provided with the sliding cover, d d, with the furnace, C D F, the several parts being constructed, arranged, and operating together, substantially in the manner and for the purpose specified.

70,558.—MACHINE FOR STAMPING AND SHAPING LEATHER.—Benjamin B. Harris (assignor to himself, F. G. Harris, and Seneca Sly), Lockport, Ill.

I claim, 1st, The combination of the toggle joint and levers, all as set forth, with the follower, C, hung from the frame, A, having the stage post, B, hung from it, and playing through a loose mortise, in manner substantially as herein shown and described.

2d, The die or knife plate, I, carrying the knife, k, sliding in the dovetailed groove, g, on stage, G, which is furnished with the hole, m, and bolted by the dovetailed pin, L, to the stage, G, all as set forth, in combination with the toggle joint, levers, and followers, substantially as herein shown and described.

70,559.—COMPOSITION FOR TEMPERING STEEL.—F. G. Harris, Willsborough, N. Y.

I claim the composition formed of the ingredients combined with each other in the proportions herein described and for the purpose set forth.

70,560.—CAR WHEEL.—John Harris (assignor to John S. Vine) Marquette, Wis.

I claim the flanges, c c', upon the hub, B, and plate, d forming the chambers for the lubricating material upon the sides of the rim, D, as herein shown and described for the purpose specified.

70,561.—CURB FOR WATER WHEELS.—John H. Hartsuff, New Castle, Pa., assignor to himself, R. W. Cunningham, and R. C. Dunlap.

I claim the tongues, D D, provided with the hinged flaps, E E, and used in combination with the wheels, A and B, constructed and operating as and for the purpose set forth.

70,562.—BARN DOOR OR GATE FASTENING.—L. B. Hayes and William Morris, of Greene, N. Y.

We claim, 1st, The combination of the vertical bar, C, spring catch, E, and catch, I, with each other, and with the door or gate, A, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the band or collar, L, and block, K, having a pin, k', attached to its edge, with the bar, C, substantially as herein shown and described and for the purpose set forth.

70,563.—TOOL FOR CUTTING BOLTS.—J. E. Heath, Niles, Mich.

I claim, 1st, The combination of the plate, A, cutters, C C, levers, D D, and springs, a a, arranged as described.

2d, The slotted guide plate, B, projecting between the cam lever, D D, from the plate, A, as shown, in combination with the jointed arms, E E, cam levers, D D, and cutters, C C, substantially as and for the purpose set forth.

70,564.—PHOTOGRAPHIC PRINTING FRAME.—John Heddon, Elkhart, Ind.

I claim the hinged back, of five pieces, more or less, so constructed that any or more may be fastened together, or an opening be effected at either of the joints, thus admitting the examination of the printing from either end of the frame.

Also, the broad flanges, in connection with the adjustable grouping board, which movable perforated board, or any other material answering the same purpose, I also claim, this being equivalent to the movable or sliding frame for carrying the back up or down.

I claim the adjustable and sliding back, also, the vignetting arrangement for excluding the light from the sensitive paper, by the use of two pieces of board, or other material, with a tube for conducting the rays of light to the negative.

I claim this invention, separately and as a whole, in combination one with the other, substantially as set forth above.

70,565.—HOISTING APPARATUS.—Philip Higdon, Lewisport, Ky.

I claim the combination of the frame, A A1 A2, shaft, B, pulleys, D F J K pinion, G, cords or ropes, E I, rack, d, either jointed or inflexible, and movable sheave, L, all arranged and operating substantially as described.

70,566.—CHILDREN'S CARRIAGE AND CRADLE.—C. W. Higgings, Waukesha, Wis.

I claim a children's carriage, when constructed substantially in the manner and for the purposes described.

70,567.—LAMP EXTINGUISHER.—F. B. Hill, Cleveland, O., and W. H. McCoy, Des Moines, Iowa,

We claim the combination of the cap, C, pendent bars, c, rod, B, crank, d, and spring, f, arranged to operate in the manner and for the purpose herein specified.

70,568.—REGISTER POINT FOR PRINTING PRESSES.—Nicholas Hopkins, N. Y.

I claim, 1, The hinged plate, B, having a metallic point, C, attached to its movable part, to be used in connection with a piece of furniture in making up the form, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of one or more rubber or other elastic bearers, D, with the movable part, b2, of the hinged plate, B, substantially as herein shown and described for the purpose set forth.

70,569.—TOY.—Kellis Horde, Washington, D. C.

I claim the plunger, B, combined with tube, A, and lever, a, for operating toys, substantially as described.

70,570.—BEVEL.—Leonard D. Howard, St. Johnsbury, Vt.

I claim the applying of a blade screw and nut to a bevel, in the manner shown, or in an equivalent way, so that the head of the screw and the nut will be flush with the sides of the handle or stock, as set forth.

I also claim the cap, C, applied to the end of the handle or stock, and provided with the concave or countersink, d, at one side, and the socket, E, at the opposite side, to receive, respectively, the screw head and the screw nut substantially as shown and described.

70,571.—BOOT BLACKING AND POLISHING MACHINE.—S. W. Huntington, Augusta, Me.

I claim the combination in a machine, such as described, with one or more rotating brushes, of an adjustable trough or blacking receptacle, substantialy in the manner and for the purposes herein shown and set forth.

70,572.—SADIRON HEATER.—George Hurdman (assignor to Chas. F. Clark), Wolverhampton, England.

I claim, as my invention, the improvements in charcoal-box sad irons, hereinbefore described, that is to say, the combination of the rod, pin, or guide, g, and eyes or brackets, f f, with the body and lid or cover of charcoal-box irons for the purpose of permitting of the sliding of the lid or cover upon the body, substantially as described and illustrated.

Also, the combination with the said parts, f g, of the turn or button, h, for fastening the lid or cover, and the knob or handle, l, for holding the iron during the sliding of the lid or cover, substantiully as described and illustrated.

70,573.—VAPOR-LAMP BURNER.—W. W. Jacobs, Hagerstown, Md.

I claim the combination of tube, A, pan, D, screw cap, B, and wick, C, constructed and arranged substantially as shown and for the purpose set forth.

70,574.—KNIFE CLEANER AND SHARPENER.—L. J. Johnson, Montville, Conn., assignor to himself and Erskine A. Cole.

I claim, 1st, The composition of the box, A, with the corks, c c, and the handle, F, containing the knife sharpener, L, the cylindrical covered box, G, with the cylindrical cup, H, and polishing apparatus, I, substantially as shown and described and for the purpose specified.

2d, The combination of the cylindrical polishing band, I, and cork, J, with the box, A B, as shown and described and for the purpose specified.

70,575.—DRESS ELEVATOR.—George William Keller, Philadelphia, Pa.

I claim the spiral spring girdle or belt, A, provided with openings, B, in combination with spring, C, cord, D, and strings, E, substantially as herein set forth.

70,576.—DOOR LOCK.—Michael Knapp and John Knapp, Hudson City, N. J.

We claim, 1st, Guiding the secondary tumbler, D, through the slotted guides, d, and through the grooved tumblers, b b, said secondary tumbler provided with the projections, g, as described, and connected with the spring, h, operating as and for the purpose specified.

2d, The combination and arrangement of the bolt, B, tumblers, b b, secondary tumblers, D, guides, d, and springs, a c h, all operating as described, for the purpose specified.

3d, So constructing a lock that the same can only be locked and unlocked by turning the key in one direction only, as set forth.

70,577.—PEGGING JACK.—John K. Krieg, New York city.

I claim the construction of the hollow last holder, in combination with the pin rod inserted therein and adjustable, for the purposes and as specified.

70,578.—CULTIVATOR.—S. A. Kroner, New Britain, Pa.

I claim, 1st, The trestle, H, in combination with the handles, B, and beam, A, for the purpose of shifting the handles, in the manner and for the purpose specified.

2d, I claim the movable sides, C and C', in combination with the plates, D and F, the slide, E, and pin, G, in the manner and for the purpose set forth.

3d, I claim the arrangement of the shares, K, in combination with the movable sides, C and C', plates, F and D slide, E, trestle, H, and clevis, I, in the manner and for the purpose set forth.

70,579.—UMBRELLA RUNNER.—Henry Kurth, Brooklyn, N.Y.

I claim an umbrella runner provided with the locking device consisting of the supporting piece, f, locking ring, e, in combination with pins, C and d, in the handle, substantially as described,

70,580.—CLEAT CHOCK.—Amariah Lake, Smith's Landing, N.J.

I claim a cleat chock made and employed substantially as herein shown and described.

70,581.—MACHING FOR PEGGING BOOTS AND SHOES.—Wm. R. Landfear, Hartford, Conn., assignor by mesne assignments of David Whittemore.

I claim, 1st, Passing the pegs severed from the peg wood from the severing knife to the driving bar, through a slot in the axle of the feeding sleeve, substantially in the manner and for the purpose described.

2d, The combination of the bar, A1, bolt, B', and set screw, C', arranged substantially as specified, for securely holding down the peg wood during its passage through the machine, as set forth.

3d, The application of an adjustable brake to control the movement of the feeding sleeve, in the manner described.

4th, The plates, F' and C', arranged as described, and forming grooves for the passage of the awl and driver in front of the feeding sleeve, as specified.

70,582.—CONSTRUCTION OF ICE PITCHERS.—Nathan Lawrence (assignor to Reed & Barton), Taunton, Mass.

I claim, 1st, An ice or double-walled pitcher having its inner wall or lining spun or swaged out of one piece of metal, or swaged out of a single piece, so that the bottom will be seamless or without a joint, substantially as described.

2d, The securing of the ribs, b, to the bottom of the inner wall or lining, substantially as and for the purpose specified.

70,583.—BED BOTTOM.—Frederick Leadbetter, Plymouth, Mich.

I claim connecting the slats, B, to the ends of the bedstead by means of the wires, C, connected to the ends of the slats, as shown, and attached at their outer ends to bars, D, which are fitted loosely on V-shaped wires, E, driven in the ends of the bedstead, and having spiral springs, f, upon them, as herein set forth.

70,584.—PROPAGATING TANK AND BED.—N. H. Lindley, Bridgeport, Conn.

I claim the valves, E E', as described, and their adjustability in combination with the hot water channels, C D, propagating bed, a, hot air space, a x, and deflector, c, substantially as described for the purposes specified.

70,585.—BRICK MACHINE.—Stephen W. Long, Louisville, Ky.

I claim, 1st, The arrangement in a brick machine of two plungers, I K, so as to form a measure, and to exert upon the clay compressive forces in directions perpendicular to each other, substantially as described.

2d, The combination of the plungers, I K K', sliding molds, J J' J', chambers, o o' o'', and pug mill, G D, all arranged and operating substantially as and for the purpose herein specified,

70,586.—ICE TONGS.—R. M. Mansur, Augusta, Me.

I claim the ice tongs or hook provided with the elastic arms, A, and the angular, sharpened, or pointed prongs or teeth, C, constructed and operating in the manner and for the purpose set forth.

70,587.—HANDLE FOR SHIPS' PUMPS.—Knud Markuson (assignor to himself and Leonard A. Burnham), Gloucester, Mass.

I claim the improved pump handle, as made in two parts, A B, connected together by two hinges, or by a hinge and latching or locking devices, applied to their opposite sides, the whole being substantially as specified.

I also claim the arrangement and combination of the rotary rod, made as described, and the socket for the head of such rod, with the two handle parts, A B, connected substantially as explained.

70,588.—MANUFACTURE AND APPLICATION OF BISULPHITE OF LIME.—Wm. Marr, New York, City.

I claim, 1st, The new article of manufacture, liquid bisulphite of lime, prepared substantially as herein described.

2d, The improved mode of arresting fermentation in beer, ale, and other fermented liquors, by the application of liquid bisulphite of lime, substantially as herein described.

3d, The application of liquid bisulphite of lime for preventing fermentation in saccharine and other fermentable liquids.

4th, The application of liquid bisulphite of lime for preserving meat and fish, substantially as described.

70,589.—HARNESS SADDLES.—Godfrey Marshall, Indiana, Pa.

I claim a harness saddle constructed with its cushion or pad substantially as and for the purpose described.

70,590.—STEAM ENGINE.—Emory McClintock, New Brunswick, N. J.

I claim the combination of the valve ports, S S' E E' U U' L L, in the cylinders, C C', and the passages, a b c d and a' b' c' d', in the double-acting pistons, P P', said pistons serving as four-way valves, all substantially as herein described, for the purposes specified.

70,591.—LIFTING JACK.—Wm. McMillen, Milan, assignor to himself and Z. King, Cleveland, Ohio.

I claim the arrangement of the legs, A A', in combination with the lever, C, and link, B, when pivoted or jointed in the manner substantially as described.

70,592.—PLANING MACHINE.—Rufus N. Meriam, Worcester, Mass.

I claim the slides, F F*, carrying the shafts, C C*, and constructed with racks, d d*, in combination with the blocks, B B*, formed with standards, E E*, and the pinions, e e*, whereby the said shafts may be raised or lowered with reference to the bed, a, constructed and operating substantially as herein set forth.

70,593.—SASH SUPPORT AND FASTENER.—Fenwick R. Miller and Edwin Prescott, Pittsburg, Pa.

We claim the upper cam, d, in combination with the lower cam, d, so constructed, arranged, and connected, substantially as described, as to press against the rail or frame of the window in opposite directions by means of the weight of the upper cam, and the lock and support the sash in any position in which it may be placed, while the depressing of the lower cam shall also raise the upper cam, and thus leave the sash free to be raised or lowered.

70,594.—MODE OF SECURING WHEELS ON AXLES.—J. Miller, Jr., Baltimore, Md.

I claim the combination of the box, A, spring, B, plate, C, and the linchpin, D, or their equivalents, operating in the manner described and for the purposes substantially as set forth.

70,595.—CYLINDER OF STEAM HAMMERS.—Robert Mitchell, Wolverhampton, Great Britain.

I claim the peculiar arrangement of steam ports and ways in the cylinders of double acting steam hammers and forging machines, substantially as and for the purpose hereinbefore described, and illustrated by Fig. 5 of my drawing,

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70,596.—APPARATUS FOR MOVING BUILDINGS.—John H. Moore, Binghamton, N. Y.

I claim the hinged latch, G, and the catch, H, in combination with the reach or sand board, C, and bolster, F, all constructed and arranged substantially as and for the purposes set forth.

70,597.—HINGE.—Antonio L. Mora, New York City.

I claim, 1st, the pawl, D, and the spring, E, constructed, arranged, and operating substantially as and for the purposes described, in combination with a ratchet hinge.

2d, The pin, f, by which the pawl is tripped, substantially as described, in combination with the pawl, D.

2d, In combination with the pawl, D, I claim the ratchet, C, and the stop plate, F, substantially as described.

4th, In combination with a hinge, I claim the plates, A and B, substantially as and for the purposes described.

70,598.—LUNCH BOX.—Jonn F. Morgan, Boston, assignor to Cornelius S. Hurlbut, Springfield, Mass.

I claim a lunch or dinner box as an article of manufacture, the end plates and side plates of which are joined to each other and to the bottom plate of the box by hinges, and the end plates of which are made of two parts or pieces connected by hinges, which traverse the end plates diagonally, and one side plate of which is made of three parts or pieces connected together by hinges, so that the box can be folded flat without detaching any part of it, beside the top or cover, from the other parts, substantially as herein set forth.

70,599.—PERMUTATION LOCK FOR DOORS, ETC.—John H. Morse, Peoria, Ill.

I claim, 1st, The push pin, S, with its spiral spring, s, acting on click, K, in combination with hub plate, D, with its notches, d.

2d, I also claim the rubber pad, o, or its equivalent, on lug, J.

3d, Also the bolt, K with its slot, H, and lug, G, on lug bar, E, all working in the manner and for the purpose specified.

70,600.—INSTRUMENT FOR ADMINISTERING BALLS TO HORSES.—Chas. P. Moyer, Womelsdorf, Pa.

I claim, 1st, The india-rubber or pliable cup, E, the cup, A, and the plunger D, used substantially as and for the purpose set forth.

2d, The shield, C, in combination with the tube, B, and plunger, D, when used as and for the purpose specified.

70,601.—MACHINE FOR MAKING PAPER BAGS.—E. B. Olmsted, Washington, D. C.

I claim, 1st, The combination of the feed and printing roller, F, with the inking roller, I, the cutting roller, F', and the gumming roller, G, substantially as and for the purpose described.

2d, The combination of the cutting edge, h, and knife, k, when used in an apparatus for making paper bags or envelopes, and when the parts are constructed, combined, and operating in the manner and for the purpose herein specified.

3d, The combination of the two folding devices, M and K, substantially as and for the purpose shown.

4th, The combination of the roller, N', and leaves, n n', when constructed and operating in the manner and for the purpose set forth.

70,602.—MEDICAL COMPOUND.—Bird Paine, McMinnville, Tenn.

I claim the combination of pulverized ipecacuanha with the other remedies as described, above, whereby the well known deleterious effects of quinine in large doses are prevented, and the aggregate healing properties of the combination greatly enhanced.

70,603.—ORE SEPARATOR AND CONCENTRATOR.—Thomas N. Paine and Samuel Stephens, Grass Valley, Cal.

We claim, 1st, The pan constructed with the copper-lined recess, h, at its top to save the gold or amalgam, substantially as herein desctibed,

2d, The adjustable distributing spouts, constructed with the parts, d e and f, and having the adjusting screw, g, the whole operating substantially as and for the purpose herein described.

3d, The round arms, E, with the separated brushes, r r r r, for agitating the surface of the pulp, operating substantially as herein described.

4th, The ring rising automatically, and the rod, b, together with the endless screw, L, and the cone pulleys, K and K', when used for raising the ring, H, substantially as herein described.

5th, The movable feed-trough, G, and the reservoir, M, supported by the rollers, k k, and the plate, l, operating substantially as and for the purpose described.

6th, The revolving belt, n, with its brushes and the perforated plate, p, when used in the feed-trough, G, substantially as herein described.

7th, The two-part shaft, constructed with a hollow stationary slotted shaft, C, and the hollow movable slotted shaft, D, when constructed with the balls and the grooves in their ends to prevent friction, operating substantially as and for the purpose herein described.

70,604.—WINDOW-SASH SUPPORTER.—Joseph R. Payson, Chicago, Ill.

I claim the friction plate, A, with its projection, B, in combination with the inclined surface, a, and the spring, E, all aranged as shown, or in an equivalent way, for the purpose specified,

70,605.—WRENCHES.—Edward Perry, Hopkinton, Mass.

I claim the combination with the frame or stock, A, of the movable jaws, E E, screws, D D, and rosette, C, substantially as and for the purposes set forth.

70,606.—RAIL-CLAMP JOINT.—Francis Pidgeon, Saugerties, N. Y.

I claim, 1st, The combination of the dove-tailed rails, E, and dove-tailed clamps, G H, substantially as described, for the purpose specified.

2d, In combination with the above, the outer section of the clamp flush with the head of the rail, substantially as described, for the purpose specified.

70,607.—WAGON REACHES.—Zenas Plumb, assignor to himself and John C. Polley, De Witt, Iowa.

I claim constructing a wagon-reach in two parts, connected by a swivel-joint, substantially as and for the purpose described.

70,608.—FERTILIZER.—Henry E. Pond, Franklin, Mass.

I claim the new fertilizer, substantially as before described.

70,609.—COMBINED DOOR FASTENER AND POCKET KNIFE.—Benjamin F. Porter, assignor to himself and Timothy S. Mitchell, Manchester, N. H.

I claim the door fastener, B, constructed and arranged to operate as described, in combination with a pocket knife.

70,610.—TOY HUMMING WHEEL.—W. D. Porter (assignor to himself and James H. Platt, Jr.,), Petersburg, Va.

I claim the toy wheel, E, formed by the union of two concave disks, united at their peripheries, and provided with one or more openings, D, and the loops, A, when said parts are constructed and arranged as herein shown and described.

70,611.—SACK FASTENER.—Theodore Purse and Henry C. Draper, Ashley, Mo.

We claim the sack fastener, consisting of the two pieces of wire, A B, ninged or pivoted at C, when bent and arranged to operate substantially as described.

70,612.—PRIMING METALLIC CARTRIDGES.—Joseph Rider, Newark, Ohio, assignor to himself and E. Remington and Sons, Ilion, N. Y.

I claim, 1st, A shell without an end piece, and a flange turned and projecting forward on its inside, substantially as and for the purpose described.

2d, I also claim, in combination with a shell having an inward flange, a base, B, having a recess for a cap, and holes extending from said recess to the charge in the cartridge, and removable and replaceable, substantially as and for the purpose described.

70,613.—DREDGING, SPICE, AND PEPPER BOX.—George W. Putnam, Peterboro, N. Y.

I claim a dredging or spice box, perforated upon its sides, substantially as herein shown and described.

70,614.—HARVESTER.—Amos Rank, Salem, Ohio.

I claim, 1st, The side delivery scraper, hinged to the outer divider, or its equivalent, so as to allow it to conform to the undulations of the ground, in combination with a grain platform or receiver, which is arranged behind the cutting apparatus of a harvester, and applied so as not to revolve, substantially as described.

2d, A slatted tilting or hinged platform, D, arranged behind the finger beam of a harvester, in combination with a scraper, G, which operates as shown, for the purpose set forth.

70,615.—SULKY PLOUGH.—John H. Rankin, Versailles, Mo.

I claim, 1st, The cultivators, C, constructed as above described and for the purpose set forth.

2d, The cultivators, C, screw, l, nut, l', cords, e, drums, f, an axle, g, and handle, h, in combination with the frame, A, all arranged as above described and for the purpose set forth.

2d, The ploughs, D, constructed as above described and for the purpose specified.

4th, The cultivators, C, ploughs, D, adjusting bars, b, rail, d, screws, l, nuts, l', cords, e, drums, f, on axle, g, and handle, h, in combination with the frame, A, as above described and for the purpose set forth.

70,616.—PESSARY.—M. J. Rhees, M. D., Mount Holly, N. J.

I claim a pessary, made substantially as described.

70,617.—WELL TUBES.—John W. Ricker, Chelsea, Mass.

I claim a series of perforated conical shaped thimbles, a, applied to a well tube, constructed and operated substantially as and for the purpose described.

I also claim a well tube provided with a series of perforated conical shaped thimbles, a, from which the sand is ejected by the employment of tubes, C D, substantially in the manner set forth.

70,618.—SPRING BEDSTEADS.—Robert Roberts, St. Paul, Ind.

I claim, 1st, in combination with the bedstead, A, support, B, and cleats, F, the frame, C, springs, D, slats, E, and webbing, I, arranged substantially as and for the purpose set forth.

2d, The head piece, G, when attached by hinges to the inner and detached frame, C, substantially in the manner set forth.

3d, The combination of the slats, E, springs, D, webbing I, and hinged head piece, G, arranged substantially as set forth.

70,619.—WAGON SEAT.—R. N. Rockwell, Glenwood, Iowa.

I claim the board or plank, A, with the springs, B B', attached, in combination with the pendent pins, E, attached to the bottom of the seat, C, all arranged substantially in the manner as and for the purpose set forth.

70,620.—BAG Fastener.—Ephraim Romans, La Porte, Ind.

I claim the combination of the frame, a, plate, b, and cord, f, substantially as and for the purpose described.

70,621.—CONFORMATORS.—E. Roseen, New York city.

I claim, 1st, The bar, n, constructed with joints, 5, and hinges, 6, so that its curvature can be preserved when the apparatus is flattened out, substantially as described.

2d, The adjustable bars, v v, in combination with the curved bars, m and w, substantially as described.

3d, The combination and arrangement of the bar, j, provided with a hook at its end, the bars, s and o, and the set screw, 3, connecting the bars, s and t, substantially as described.

70,622.—SPINNING WHEEL.—Jonas H. Rowe, Hudson, N. Y.

I claim, 1st, The arrangement of the vibrating arm, F, carrying the adjustable spindle head, G, said arm supported from the adjustable bar, E, and resting upon the spring, e, with the adjustable bar, D, and connecting rod, L, pivoted in said arm, F, as herein described, for the purpose specified.

2d, The combination of the bent spring, e, with the vibrating arm, F, adjustable rod, C, and connecting rod, L, as herein described, for the purpose specified.

70,623.—ROTARY CAM FOR LOOMS.—Ransom Sargent, Norwich, Vt.

I claim the rotary loom cam formed of a centre shaft, a, provided with heads, b', on the periphery of which are hung the truck shafts, c, in the adjustable boxes, d, for carrying the adjustable circular cams or trucks, E, to operate on the cam blocks, D, placed on the treadles, C, constructed, arranged and operating substantially as and for the purposes herein described.

70,624.—ANIMAL TRAP.—Jeremiah Schroy, Fort Ville, Ind.

I claim the drop, o, in the removable chamber, C, when such drop is provided with the fixed shoe or prolongation, r, arranged as described, whereby the weight of the animal upon said shoe prevents its being raised, as herein set forth.

70,625.—CAR COUPLING.—Lewis O. Schultz, Mattoon, Ill.

I claim the catch, F, the coupling pin, C, the guides, D and E, and the lifting rod, d, constructed and arranged substantially as described, in combination with the draw head of a railroad car, for the purpose set forth.

70,626.—GATES.—L. M. Scothorn, Findley, Ohio.

I claim, 1st, The double post, B, constructed as and for the purposes substantially as above set forth and described.

2d, The upright movable post, C, working in a groove in the post, B, and provided with the roller, c, substantially as above set forth and described.

3d, The main and extension gates, consisting of vertical and horizontal bars, D d, F, G, H and H', or their respective equivalents, and provided with rollers, D' D', g' g', in manner and for the purposes substantially as above set forth and described.

70,627.—WHIP SOCKETS.—E. W. Scott, Wauregan, Conn.

I claim a whip socket provided with a fastening composed of a lever arranged or applied substantially as shown and described, to hold the whip steady or firm in its socket, as set forth.

70,628.—ADJUSTABLE PROP-JOINTS FOR CARRIAGES.—Anson Searls, San Francisco, Cal.

I claim, 1st, An adjustable or extension prop joint.

2d, A socket, pivoted, or center joint, all substantially as described, and for the purposes set forth.

70,629.—TRUSS.—Isaac B. Seeley, Philadelphia, Pa.

I claim a supporter made of hard, vulcanized India rubber, substantially as and for the purpose described.

70,630.—WASHING MACHINE.—G. C. Selfridge, Saratoga Springs, N. Y.

I claim the combination of the slotted cover, C, hinged lids, D D', sectional wash board, E, double oscillating plungers, I, arms, H, rock shaft, G, removable connecting rods, K, working above the lid of the suds box, pins, b, crank shaft, J, as herein described for the purpose specified.

70,631.—FOLDING UMBRELLAS.—A. B. Shaw, Holderness, N. H.

I claim the combination of the auxillary runner, F, and its series of spreaders, G, with the staff, the main runner, D, and its series of spreaders, E, and each of the ribs, formed in two parts, c d, and applied together, substantially as described.

Also, the connection of the ferrule to the staff by means of the spring, arranged within and applied to such ferrule and staff, substantially as set forth.

Also, the connection of the ferrule to the staff by means of the screws and the spring applied to them, substantially as specified.

70,632.—FOLDING UMBRELLAS.—A. B. Smith, Holderness, N. H.

I claim the combination of the rib-locking mechanism, with the braces and with the ribs, each made in two parts, e f, and applied together, so as to enable the lower ones, e, to be moved with respect to the upper ones, f, substantially in manner as specified.

Also, the rib locking mechanism, composed of the slide rod, o, the collar, n, the series of locking rods, l, the staples, k, and the arms, i, the whole being constructed and arranged together as explained and represented.

Also, the combination of the spring, r, with the stick, and the locking apparatus applied to the ribs, and arranged to operate substantially as described.

70,633.—HARNESS PAD TREE.—Palmer Shaw and Edward S. Dawson, Syracuse, N. Y.

We claim the elastic plate, e, covering the joint between the cut-off end, a, and the pad, A, and connecting the two parts, substantially as described for the purpose specified.

70,634.—PUMP.—George Shield, Cincinnati, Ohio.

I claim, 1st, The combination and arrangement of the hollow plunger, C, valve rod, D, valve, d, solid or closed plunger, E, plate, e, and stuffing-boxes, a a, as herein described, for the purpose specified.

2d, The solid or closed plunger, E, in combination with the hollow plunger, C, valve, d, and discharge passage, A', as herein described, for the purpose specified.

3d, The double-plunger pump, constructed as described, consisting of the barrel, A B, with branches, A' B', stuffing-boxes, a a, hollow plunger, C, solid or closed plunger, E, valve, d, plate, e, chamber, F, and pipes, G g, as herein described, for the purpose specified.

70,635.—LAMP.—John B. Slawson, New Orleans, La.

I claim, 1st, Arranging the burner, B, at or near the end of the reservoir, A, substantially as and for the purpose herein shown and described.

2d, Arranging a reflector, C, at or near the corner of the reservoir, the said reflector being made substantially as herein shown and described.

3d, A lamp, A, when provided with a burner, B, which is arranged at or near to its end, so that it will be at or near one corner of the fare box, in combination with the reflector, C, which is made and arranged substantially as and for the purpose herein shown and described.

70,636.—APPARATUS FOR CLEANING STOVE-PIPES.—A. W. Smith, Pierpont, N. Y

I claim the scraper, formed by the combination of the semi-circular plate, D, handle, E, brace and guard wires, F, and spring, H, with each other, substantially as herein shown and described, and for the purpose set forth.

70,637.—PADDLE-WHEEL.—E. C. Smith (assignor to himself and A. G. Sommerfeldt), Old Ripley, Ill.

I claim the fixed eccentrics, a a, in combination with the collars, c c, the disks, C C, or their equivalents, provided with the circular holes or rings, 1 2 3 4, the pins, e e, on the collars, c c, the jointed arms, b b, the paddles, D D, and the shaft, A, the whole constructed, arranged, and operating, substantially as and for the purpose herein described.

70,638.—GRATE BAR.—J. R. Smith, Salem, Mass.

I claim, 1st, The double-curved ribs, A, in combination with the flanges, B B, and connections, a, substantially as and for the purposes set forth.

2d, The combination with the double-curved ribs, A, of one or more projections, b, flanges, B B, and connections, a a, as and for the purposes set forth.

3d, The combination with the side of the bar, of the peculiarly constructed filling piece, composed of the parts lettered B' B', C D, and E, for the purposes stated.

70,639.—WAGON BRAKE.—Thomas Smith, California, Mo.

I claim, 1st, The band, C, and bolt, D, constructed and secured to the brake-bar, A, substantially in the manner herein shown and described, and for the purpose set forth.

2d, The clamps, G, constructed as described, in combination with the rod or bolt, D, and band, C, substantially as and for the purpose herein set forth.

70,640.—COVERING FOR WALLS OF PARLORS AND SALOONS.—J. M. Soutrenon, New York city.

I claim as an improved article of manufacture, a covering for parlor walls, composed of ornamental silk gauze combined with a backing of paper or other suitable material, as and for the purpose described.

70,641.—GASOLINE COOK-STOVE.—J. D. Spang, Dayton, O.

I claim, 1st, The disk, c', with perforated rim, c'', substantially as described.

2d, The disk, c', perforated rim, c'', in combination with the ring, b', and burner, C, substantially as described.

70,642.—FINISHING BRAD.—Henry Stanton, Syracuse, N. Y.

I claim as an improved article of manufacture, the finishing brad, made as herein shown and described, as and for the purpose set forth.

70,643.—HORSE-RAKE.—Henry K. Stoner, Lancaster, Pa.

I claim the arrangement and construction of a cylinder, A, with an arm, B, extending from it at right angles, when the rake tooth, F, passes through a lug, C, perforated for its reception, and held by a headed bolt or its equivalent, through its eye, f, in a lug, D, said lugs, arm, and cylinder, all of one piece, substantially in the manner shown for the purposes specified.

70,644.—LIFTING-JACK.—Jacob Stoody, Ripley, Ohio.

I claim the stand, A, the bar, B, the eccentric, D, with lever, E, and rack, F, constructed, arranged, and combined substantially as shown for the purposes set forth.

70,645.—FASTENING FOR PANTALOONS.—Isaac Stratton, Keene, New Hampshire.

I claim, in combination with the fly front of the pantaloons, the elastic cord c, arranged in the eyelet holes, a and b, substantially as and for the purpose specified.

70,646.—AMALGAMATOR.—Arthur Swazey, Chicago, Ill.

I claim, 1st, Providing the long arm, A, with the buoyant valve, F, and stop-cock, G, arranged to operate as described, and for the purpose set forth.

2d, The movable plates, d, when arranged to operate substantially as described and for the purposes set forth.

3d, The spiral, c, when arranged to operate automatically by the movement of the liquid, substantially as described and for the purpose set forth.

4th. The construction of the tube in sections, so that portions of the same may be removed as described and for the purposes set forth.

5th, An inverted siphon-shaped tubular amalgamator of movable sections with a buoyant valve, F, stop cock, G, movable plates, d, and self-acting spiral, c, when arranged to operate within the tube as described and with its bent portion surrounded with a steam jacket, I, for the purposes set forth.

70,647.—REFRIGERATOR FOR BREWERS.—Augustus H. Tait and Joseph W. Avis, New York city.

We claim, in combination with the fermenting vat, D, the arrangement of cooling apparatus substantially as described for the injection into the wort of jets of cooled air, for the purpose described.

70,648.—LAST.—Ambrose Taylor, Osawatomie, Kansas.

I claim the spring hook, E, secured by its straight shank, F, in the block, B, and engaging with the hook, C, in the recess, D, of the last, A, all constructed and arranged to operate as herein set forth for the purpose specified.

70,649.—BALING PRESS.—Joseph P. Taylor, Hudson city, N. J., and Jackson R. Baker, Jersey City, N. J.

We claim, 1st, The combination of the levers, F, yoke, C, levers, E, lifting pawls, H, and toothed racks, L, with each other and with the follower or platform, N, and bed plate or frame, B, substantially as herein shown and described and for the purpose set forth.

2d, The spring pawls, I, constructed as described having the lever, J, projecting through the side of the frame to be operated upon by the foot and the lower end projecting downward through the bottom of the press to act as a brake against the smooth surface of the vertical bars, L, in their descent when the upper part of said pawl is released from the rack, as herein shown and described

3d, The arrangement of the cover, T, constructed as described, ropes, W, keys, V, posts, U, catch bars, S, and box, O, as herein described for the purposes specified.

70,650.—LUBRICATING CARRIAGE AXLES.—Edrick Thomas, Kickapoo, Ill.

I claim the Babbit-metal tube, F, with the bolt or screw plug, E, and the hole, a, in the metallic box, C, all arranged in the manner substantially as and for the purpose set forth.

70,651.—RETAINING LINK FOR SHUTTLES.—Martha Thomas, Lower Merion, Pa.

I claim the within-described retaining link composed of a strip, e, of metal with hooks, a and b, arranged at each end, as and for the purpose herein set forth.

70,652.—MACHINE FOR CUTTING TUBES.—Nicholas Thomas, Chicago, Ill.

I claim the construction and arrangement of the stock, A and A', socket screw, B, screw, D, having its lower end inclined below its square shank, b, inclined horizontal cutter, E, spring, F, blocks, G H, and horizontal spring knobs, d1, as herein set forth for the purpose specified.

70,653.—MEANS OF SUSPENDING GASOLIERS AND DROP LIGHTS.—Samuel B. H. Vance (assignor to Mitchell, Vance & Co,), New York city.

I claim, 1st, The apparatus composed of a system of lazy tongs the arms and pivots of which are constructed with an internal gas passage communicating with a suitable burner, substantially as and for the purpase specified.

2d, The parallel guides, g, attached to the stem, f, and arranged and operating in relation with the system of lazy tongs, substantially as and for the purpose specified.

70,654.—BOTTLE STOPPER.—William Von Hofe, N. Y. city.

I claim the nut, b, and headed screw, d, entering each other and with the intervening follower, c, clamping the elastic plug, a, whereby the parts operate uniformly on each other and form a stopper of nearly uniform diameter throughout, substantially as described.

70,655.—PROCESS OF PRESERVING EGGS.—Arthur Wadgymar, St. Louis, Mo., assignor to himself, Byron Sloper and W. C. Gould.

I claim, 1st, The process of killing the animal life of the egg by the use of the substances above described, or their equivalents.

2d, The process of toughening the membrane next the shell of the egg by the use of the substances above specified, or their equivalents.

3d, The process of closing the pores of the egg shell by the use of the substances above specified, or their equivalents.

4th, The process of preserving eggs by the combination of the above-named substances, or their equivalents, when used substantially in the manner set forth.

70,656.—DEVICE FOR SCOURING MARBLE.—William Weaver, Nashua, N. H.

I claim, 1st, The box, A, provided with a movable bottom constructed substantially as and for the purpose set forth and of any suitable material.

2d, The use of a water tank, E, in combination with the sand box, A, substantially as and for the purpose set forth.

3d, Confining the bottom, B, to the box by means of bolts, and nuts, said nuts being constructed so as to answer as handles for the scourer, substantially as represented.

70,657.—COMBINATION BENCH.—William Weaver, Nashua, N. H.

I claim, 1st, The fixed and movable portions, A and C, of the top when arranged for adjustment substantially in the manner and for the purposes set forth.

2d, The movable sliding upper portion of the bench composed of the fixed and movable top and transverse sliding pieces, B B, when arranged substantially as and for the purpose specified.

3d, The movable and adjustable rising skids, F, arranged in the manner and for the purpose specified.

4th, The drilling mechanism constructed as shown and described combined with a bench, substantially in the manner and for the purpose set forth.

5th, The movable and reversible block, D, constructed in the manner and for the purposes specified.

6th, The movable and adjustable step, E, arranged for operation substantially in the manner and for the purpose set forth.

7th, The employment of the adjusting screws, a and g, or the equivalent thereof, substantially in the manner and for separate purposes as set forth.

8th, The edging notch, e, in the end of the portion G, of the bench, for the purpose specified.

9th, The combination of the movable sliding upper portion, as described the skids, F, block, D, step, E, screws, a and g, or the equivalent, with or without the drilling mechanism, the whole constructed and arranged for adjustment and operation substantially as and for the purposes set forth.

70,658.—STEAM-CYLINDER FOR FINISHING CLOTH.—Alexander Webster, Seneca Falls, N. Y.

I claim the combination and arrangement of the perforated cylinder, A perforated steam pipe, B, water pipe, E, and plate, D, substantially as described for the purpose specified.

70,659.—STOVE-PIPE DRUM.—Eben Webster, Holland, Mich.

I claim 1st, The construction of the inverted, conical, slotted cone, B, secured at its base to the inner circumference of the drum, A, and containing the inverted, conical slotted cone, C, whose apex extends slightly through the apex of the outer cone, B, and to whose base the short cylinder is secured having an outer ring resting and supported upon the flattened base of the cone, B, sliding freely thereon, all arranged and operating as described for the purpose specified.

2d, The inverted slotted cone, B, whose base supports the inner slotted cone, C, by the ring around its base turning freely thereon, the inner cone extending above and below the outer cone, as herein shown and described.

70,660.—HORSESHOE.—Jacob Wheeler, Huntington, Ind.

I claim the combination of the hinged tie or brace, D, with the hinged quarters, B.

70,661.—PITMAN-HEAD AND CRANK-WRIST CONNECTION.—Wm. N. Whiteley, Springfield, Ohio.

I claim 1st The pitman-head box, F, constructed with two bearings, whose axes are at right angles to and cross each other, substantially as and for the purpose set forth.

2d, In combination with the pitman-head box, F, the hollow wrist-pin, fig. 6, provided with the escape hole, D, so at to form a reservoir for a liquid lubricant within the journal, substantially as set forth and described.

70,662.—MACHINE FOR PEGGING BOOTS AND SHOES.—David Whittemore, North Bridgewater, Mass.

I claim 1st, The lever, V, with its bent slot, U, and pawl, a, in combination with the bar, T, and the ratchet on the surface of the feed-sleeve, all constructed and operating substantially as described.

2d, The slide, S', operating as described, and worked by lever, L', substantially in the manner and for the purpose specified.

3d, The supplemental pawl, l, engaging the ratchet wheel, m, when the pawl, c, is disengaged from it, for the purpose of preveneing the peg-wood from slipping backward while the feed roll is freed from the action of pawl, c, and the knife is severing the peg, thus aiding in imparting steadiness and precision to the movements of the peg-wood, as set forth.

4th, The knife, g, constructed arranged and operating in the manner described.

70,663.—BED-BOTTOM.—J. W. Wilder, (assignor to himself and E. Butterick), New York city.

I claim the spring-bed bottom, constructed as described, consisting of the rectangular frame, A, the slats, a b, which are provided with metallic tubes c, enclosing springs, d, which support the plungers, e, having rounded heads upon which the flexible slats of the rectangular frame, D, rest, substantially as described for the purpose specified.

70,664.—SHRINKING TIRE.—Levi Wilkinson, New Haven, Ct.

I claim the combination of the block, A, and brackets, B and C, with the screws, c and d and g and h, when the whole are constructed and fitted to produce the result, substantially as herein described and set forth.

70,665.—CLOTHES-LINE HOLDER.—J. L. Wilcox, Preble, N. Y.

I claim the endless clothes-line, M, in combination with the pulleys, d, lever, i, and ratchet, e, and pawl, g, as described, and for the purpose set forth.

70,666.—ELEVATED RAILROAD.—Wm. H. Williams, Little Falls, N. Y.

I claim 1st, The elevated railroad consisting of a track or tracks suspended over a street by means of towers, A, and cables, H, substantially as described.

2d, The supporting towers, A, constructed as above described, namely, by combining and arranging together substantially as shown, the transverse arches, E, and the compound diagonal arches, F, said arches all springing from the columns, B.

3d, The hollow connecting beams, G, which tie the arches to each other in combination with the supporting cables, H, which pass through said beams, so that they are protected and also held in place by the beams, substantially as shown.

70,667.—WASHING MACHINE.—Geo. L. Witsil, (assignor to Thomas E. Hauberger), Philadelphia, Pa.

I claim the stelliform case, with radiate sides, C, and door, D, turning upon a tubular journal, G, and having diagonal internal ribs, I, the several parts being constructed and arranged in relation to one another substantially as set forth.

70,668.—EXTENSION TABLE.—F. R. Wolfinger, Chicago, Ill.

I claim 1st, The end rails, C, formed in three or four parts, c1 c2 c3 c4, in combination with the central folds, D, substantially as herein shown and described.

2d, The combination of the narrow strips or leaves, I, with the central parts, c2 c3, of the end rails, C, substantially as herein shown and described.

3d, The central strips, J, having the legs, K, in combination with the central parts, c2 and c3, end folds, E, and central folds, D, substantially as described for the purpose specified.

4th, The narrow leaves, I, resting upon the parts, c2 c3, in combination with the leaves, G1 G2 G3 G4, as herein set forth for the purpose specified.

5th, The arrangement of leaves, G1 G2 G3 G4, and narrow strips, I, whereby the leaves, G2 G3, are folded upon the end rails, G, having the leaves, G2 and strip, I, in the same horizontal plane to form the top of the table, and the leaf, G1, folding down over the ends of the said leaves, G3 G4, as herein shown and described.

6th, The leaf, G2, hinged in an elevated position upon the side rail, B, and supporting the leaves, G1 and G2, the outer end of the leaf, G1, adjusted by the spring catch, H, as and for the purposes specified.

70,669.—MACHINE FOR HAKING BRICK.—Daniel Woodbury, Minneapolis, Minnesota.

I claim a machine for haking brick, constructed and operating substantially as herein shown and described.

70,670.—WHEEL HUB-BOX.—Elbridge G. Woodside, San Francisco, Cal.

I claim, 1st, Surrounding the box, A, with an elastic packing, B, substantially as described, for the purpose set forth.

2d, Also, in combination with the packing, B, the end packings, c and d', substantially as described, for the purposes set forth.

70,671.—PREPARATION OF FERTILIZERS.—William S. De Zang, Geneva, N. Y.

I claim the application of slags, of reducing and smelting furnaces, as a fertilizer, using the slags and adapting them for this purpose, substantially as described in the above specification, viz., in a finely pulverized condition also in combination with acids and alkalies, and also in intimate admixture with certain ammoniacal compounds, above specified.

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70,672.—FIRE-ALARM TELEGRAPH.—J. M. Fairchild (assignor to himself, J. K. Bundy, and J. M. Townsend), New Haven, Conn.

I claim, 1st, The arrangement of the sliding partition, F, the platform, C, and partition, D, with the box, A, and combined with a signalling apparatus, substantially in the manner herein set forth.

2d, Operating the key of telegraphic instruments by means of a mechanism connected therewith, but perfectly insulated therefrom, substantially in the manner herein set forth.

3d, The arrangement described of the pins or projections, a b c, etc., upon the wheel, B, when constructed so as to be adjustable to different signals, substantially as set forth.

4th, The arrangement of the lever, W, so as to arrest the movement of the wheel, R, at each revolution, as and for the purpose described.

70,673.—MECHANISM FOR OPENING AND CLOSING TELEGRAPHIC CIRCUITS.—J. M. Fairchild (assignor to himself, J. K. Bundy and J. M. Townsend), New Haven, Conn.

I claim, 1st, The arrangement of the two spindles, J K, in connection with their respective wires, upon the non-conducting plate, G, so as to open and close the circuit, substantially as set forth.

2d, The arrangement of the grooved cam wheel, C, and the lever, F, combined with the spindles, J K, so as to open and close the circuit by the turning of the wheel, C, substantially as set forth.

70,674.—PIGEON-HOLES FOR POST-OFFICES, ETC.—Henry G. Pearson, New York city.

I claim the employment of a perforated or openwork shelf for the reception of letters, packages, etc., as and for the purposes designed.

I also claim the same when applied as to be readily removable, as and for the purpose described.

REISSUES.

2,794.—FIRE-PROOF CEILINGS AND ROOFS.—Joseph Gilbert, Philadelphia, Pa.

I claim, 1st, A ceiling composed of girders, corrugated plates and socket bearers adapted to the said plates, and supported by the girders, all substantially as described.

2d, In combination with the above I claim the bricks or blocks, X X, applied substantially in the manner and for the purpose described.

2,795.—DITCHING MACHINE.—Henry C. Ingraham, Tecumseh, Mich.

I claim, 1st, The combination of the double flanged wheel, A, and belt, Q, which, revolving in the same direction, will carry the earth loosened by the plow over the wheel, substantially as set forth.

2d, Attaching the draught and also the plow frame to the axis of the wheel, A, substantially as and for the purpose set forth.

3d, The combination of the double mold board plow, H, and single mold board, J J, with the belt, Q, and double flanged wheel, B, substantially as set forth.

4th, Hinging the main frame, C, to the tongue irons, substantially in the manner and for the purpose set forth.

5th, The arrangement of the double flanged wheel, A, and chute, F, when the latter is so constructed as to serve also as a scraper for clearing the earth from the wheel, substantially as set forth.

6th, The arrangement of the segments, M and N, frame, V, and lever and catch, H, substantially as set forth.

7th, The combination of the lever, R, rod, T, bent arm, K, and wheel, L, for the purpose of adjusting the depth of the plow, H, substantially as set forth.

8th, The combination of the lever, O, and pawl attached to the frame, C, and segment, U, for raising the wheel, A, and the other mechanism, substantially as set forth.

9th, The combination of the double flanged wheel, A, endless belt, Q, tightening pulley, x, and pulley, I, arranged to operate substantially as set forth.

2,796.—METHOD OF OBSTRUCTING ICE IN RIVERS AND HARBORS.—Peter Veerhis, New York city.

I claim the employment of removable ice obstructors, arranged to operate substantially as set forth.

DESIGNS.

2,818.—BURIAL CASKET.—Benj. R. Bacon, Philadelphia, Pa.

2,819.—TRADE MARK.—John T. Bailey (assignor to himself and James Cascaden), Philadelphia, Pa.

2,820.—CANS.—Christian Barry, Philadelphia, Pa.

2,821.—REFLECTOR.—Elizabeth Himes, New Albany, Ind.

2,822.—MELODEON-CASE.—John R. Lomis, New Haven, Ct.

2,823.—MOULDINGS.—Edward Martin, Burlington, Vt.

2,824.—SMOKING PIPE.—Wm. Masters, New York city.

2,825.—ORNAMENTAL TABLE GLASSWARE.—H. Sellers McKee, Pittsburg, Pa.

2,826.—COFFIN HANDLE.—James S. Ray, East Haddam, Ct.

2,827.—TRADE MARK.—Jas. N. Schoonmaker, Pittsburg, Pa.

2,828.—BAND SLIDE.—Edward Sealy, Newark, N. J.

2,829.—PENDANT FOR HAT BAND.—Edward Sealy, Newark, N. J.

2,830.—OIL CLOTHS.—Wisner H. Townsend, New York city.

NOTE.—Nothing is more indicative of the progress of inventions than the long list of patents reported in these columns from week to week. The increase in the number of applications for patents this year, over any previous one, is very great. Through the agency of this office alone, SEVENTY-FIVE PATENTS were issued last week, and are reported above. During the month of October, we had the pleasure of forwarding official circulars of allowance of their patents to 351 inventors, whose cases were conducted through the Home Department of the Scientific American Patent Agency, beside a large number through our Washington Branch Office. With more than twenty years experience, and a large business, which enables us to bring to our assistance a large number of first class mechanicians, some of which have been with us for more than a score of years, we are enabled to do the work of preparing applications for patents cheaper and more expeditiously than can be done elsewhere.—EDS.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., *37 Park Row, N. Y.*

23,703.—MACHINE FOR MAKING DRAIN PIPE.—Bradford S. Pierce, New Bedford, Mass., and Mason R. Pierce, Woodstock, N. Y. Dated April 19, 1859. Reissue No. 1,897. Dated Feb. 28, 1865. Application for Reissue received and filed Oct. 24, 1867.

1st, We claim a mold consisting of a case capable of being properly secured around the material while the pipe is being molded, and of being freed from the pipe when the molding is completed, in combination with a core and also with a core socket, having a provision for freeing the socket or pipe, or both, from the core, the whole operating substantially as set forth.

2d, A mold in which the core socket is made separate and distinct from the other parts, and so formed and so combined with such other parts that it is capable of being connected with them when the mold is ready for use, and of being continuously kept connected with them during the entire process of molding and finishing the pipe, substantially as and for the purposes described.

3d, The arrangement of the mixing apparatus and of the core-relieving devices above the platform which conveys the molds in the manner and for the purpose substantially as specified.

4th, The combination of the core socket with the revolving disk, which receives the core and the mold, when the disk contains a provision for enabling the socket or pipe, or both to be freed from the core, the whole operating substantially as described.

9,531.—SCYTHE FASTENING.—Pinckney Frost, Springfield, Vt. Dated Jan. 11, 1853. Reissue No. 524. Dated Feb. 9, 1858. Application for Reissue received and filed Oct. 26, 1867.

I claim the loop bolt provided with the groove, b, and the hook or loop, e, in combination with the set ring, and also provided with a groove, d, all constructed and arranged substantially as and for the purpose set forth.

40,695.—THRASHER.—David Lippy and Jas. Bradley, Mansfield, Ohio. Dated Nov. 24, 1863. Application for Reissue received and filed Sept. 19, 1867.

We claim the cranks, c c c, of shafts, F, and bars, b b b, all arranged and operating substantially in the manner and for the purpose set forth.

69,755.—COMB.—Jas. H. Briggs, Brooklyn, N. Y. Dated Oct. 25, 1867. Application for Reissue received and filed Oct. 23, 1867.

I claim the longitudinal flanges, b, on the metallic part, B, constructed as described, and fitting over longitudinal shoulders, a, in the part or parts, A, as herein set forth for the purpose specified.

57,132.—WASHER FOR BOLTS.—Gibbons G. Hickman, Frank Hickman, and R. L. Baldwin, Coatsville, Pa. O. P. Baldwin, Brooklyn, N. Y., and J. C. Sharpless, Downington, Pa., assignees of Gibbons G. Hickman, aforesaid, and said F. Hickman, R. C. and O. P. Baldwin, and said J. C. Sharpless, assign their right to Hamilton Graham. Application for reissue received and filed Oct. 16, 1867.

1st, I claim a bolt having a groove, furrow, depression, or other equivalent provision, to receive or hold a projection or lip on the washer, so as to prevent the latter from turning on the bolt, substantially as and for the purpose set forth.

2d, Providing the washer with a lip or lips to be bent into a groove in the bolt, either with or without the lip, to be bent against the side of the nut according to the circumstances of the case, substantially as and for the purpose described.

64,028.—COOLING MILK.—Watson Peck, Babcock's Grove, Ill. Dated April 23, 1867. Application for reissue received and filed July 16, 1867.

I claim the combination of a pipe, B, provided with a receiver, C, or its equivalent, with a cooling vat, A, arranged to operate substantially in the manner and for the purposes herein set forth.

69,746.—WINDOW-SASH FASTENER.—Hobert G. Arnold, Rochester, N. Y. Dated Oct. 15, 1867. Application for reissue received and filed Oct. 1, 1867.

I claim a sash lock composed of bolt, H, tumbler, G, and notched plate, the whole combined and arranged substantially as and for the purposes set forth.

1,770.—METHOD OF SETTING THE LOGS IN SAW MILLS.—Dennis Lane, Montpelier, Vt. Dated July 9, 1861. Application for reissue received and filed Oct. 21, 1867.

1st, I claim the employment or use of the ratchets, H I J K, having teeth at different distances apart, in connection with the adjustable dog, P, placed on the rod, O, which is provided with retaining pins, h, the ratchet being placed on the shaft, F, having pinions, G G, at its ends, which gear into racks, D D, attached to bar, C, all being arranged as and for the purpose set forth.

Second, The bar, C, when provided with projecting uprights or side supports or rests, h h, for the log, substantially as described and for the purposes set forth.

3d, The dogs, l l, arranged imposts, K K, of the bar, C, substantially as described and for the purpose set forth.

4th, The side supporters or rests for the log on the setting-up bar or slide, when such rests, either one or more, are provided with a means of setting off the log, either more or less therefrom, substantially as described for the purpose set forth.

5th, The pendant, A1, attached to setting up lever, N, in combination with an incline plane, substantially as and for the purpose described.

22,310.—NUT MACHINE.—The Union Nut Machine Company, Unionville, Conn., assignees of Julius B. Savage. Dated Dec. 14, 1858. Application for reissue received and filed Oct. 18, 1867.

1st, We claim the combination of a shears with a table transferer and edge swages, substantially as described.

2d, The combination of a shears with a table transferer and face swages, substantially as described.

3d, The combination of a shears with both face and edge swages, by means of a supporting table and transferer, substantially as specified.

4th, The combination of edge swages with face swages by means of a table and transferer, substantially as described.

5th, The combination of face swages with a transferer supporting table, and a punch, substantially as described, and these in combination with edge swages, substantially as set forth.

6th, The combination of a shears, a punch supporting table, edge swages, face swages, and transferers, the combination being substantially such as described.

7th, The arrangement, in succession, of, first, a shears, second, swages, and third, a punch, substantially as herein described, so that a blank is first cut off, then swaged, and finally punched, as set forth.

8th, In combination with a punch, I claim edge swages acting to center the blank to be punched while resting upon a table, the combination being as described.

9th, In combination with edge swages, substantially such as specified, I claim a supporting table upon which the nut rests, while subjected to the action of such swages, the combination being substantially such as described.

10th, I claim, in combination with a supporting table, a transferer with a notched or angular acting face, operating both to turn and move a blank, as described.

19,408.—WHEEL AND AXLE ATTACHMENT OF HORSE-POWER, ETC.—Abram Wright and George F. Wright, Clinton, Mass., assignees by mesne assignments of George E. Burt and George F. Wright. Application for reissue received and filed Aug. 23, 1867.

We claim the use of chill-hardened cast iron axles when applied to the moving platform of treadmill or endless chain horse-power and secured either by a bolt and nut to the link or cast solid upon it, constituting a member of the same.

59,538.—COFFEE HULLERS.—Albert Angell, Newburgh, N. Y. Dated Nov. 13, 1866. Application for reissue received and filed Oct. 19, 1867.

1st, I claim the application to use without strippers or rubbers for hulling or cleaning coffee or other articles, of springs, or their equivalents, for pressing the strippers or rubbers against the coffee or other articles, substantially as described.

2d, The combination with the roughened or serrated cylinder, B, of independent spring strippers, D, arranged within a hollow segment or case that partly incircles the cylinder, substantially as specified.

3d, The divided spring strippers, D, constructed with roughened or serrated parts, arranged side by side, and also in a series, one in advance of the other, within a case, C, for operation in combination with a serrated or roughened cylinder, B, substantially as described.

65,018.—STEAM-GENERATOR GAGE COCK.—Thomas Shaw, Philadelphia, Pa. Dated May 21, 1867. Application for reissue received and filed Oct. 11, 1867.

I claim the construction and arrangement of the valve whereby to control the pressure, substantially as set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application to MUNN & CO., Solicitors of Patents, 37 Park Row, N. Y.*

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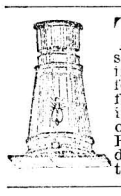

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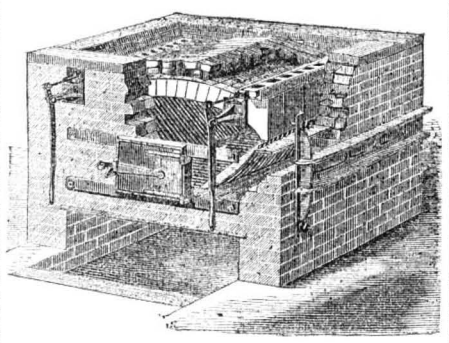

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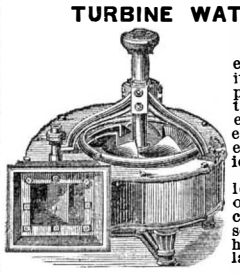
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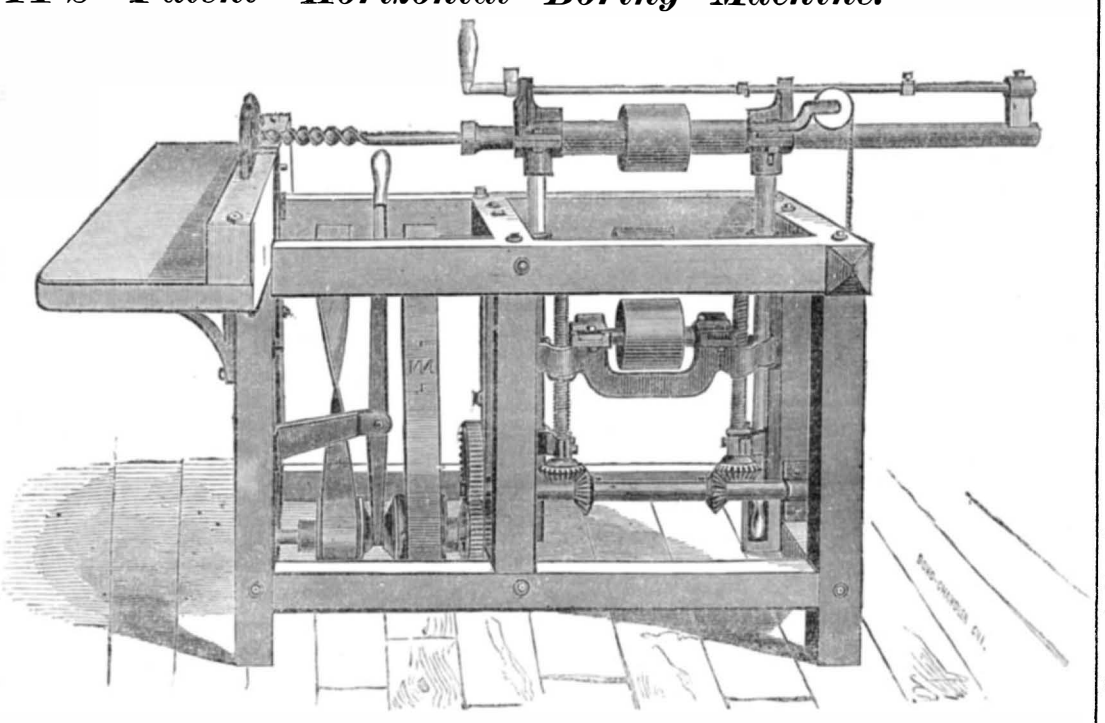

CHICAGO, March, 1867.
The accompanying cut represents the Hoit Patent Horizontal Boring Machine. To its many advantages over all other machines now made, we desire to call your attention.
Capacity, Speed, Accuracy, and Ease of Working, are among its chief points of excellence. We claim that it will do more than double the amount of work that any machine now in use can do in the same time, for the reason that the machine is self regulating by means of a small lever that the workman can move without changing his position at the machine.
The boring bar can be moved up or down to any required point instantly, instead of raising and lowering the table, as by other machines, and that by hand.
The workman has nothing to do but put the timber on the table and shift it to the different points, and the machine does the work.
Another great advantage over other machines is in end boring, such as for joint bolts and truss rods in car frames, or any angular boring. Place the time in any required position, and it remains stationary until finished. The machine is so arranged that any length of augur can be used, from twenty-two inches down to the shortest size. The accuracy of the machine will be at once seen, for the table or bed is made stationary, and is perfectly parallel with the boring bar, consequently it must always bore correctly.
It is also arranged so that the augur is held close to the timber, so that it can be seen exactly when the boring bar is set at its proper hight. The boring bar is moved up and down by means of a friction clutch, consequently, as soon as the pressure is let off the lever, the motion stops; and it is also so arranged, that it is self-supporting and will not move up or down unless the lever is applied.
The machine is adapted to all kinds of work, but more particularly to railroad car building and agricultural works. It is well and substantially made, and not liable to get out of order, and is simple and easy to manage.
The machine was invented by one of the most skillful and ingenious mechanics in the car works of the Pittsburg, Ft. Wayne and Chicago Railroad Company. As to its great value and economy, we refer to Mr. Isaac Dripps, Master Mechanic Pittsburg, Ft. Wayne and Chicago Railroad, and W. F. Ray, Master Mechanic, Toledo and Wabash Railroad, Fort Wayne, Ind. J. Mulligan, Conn. R. R. R., Springfield, Mass. T. W. Wasson, M'fg Co., Springfield, Mass.
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